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- Paradigm & PSB Speaker Systems
- Princeton HDTV





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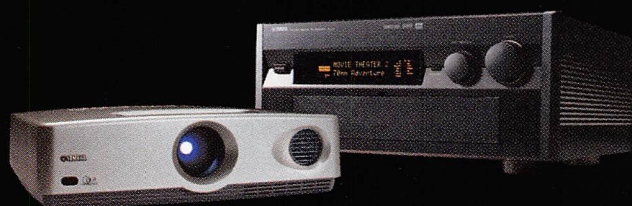
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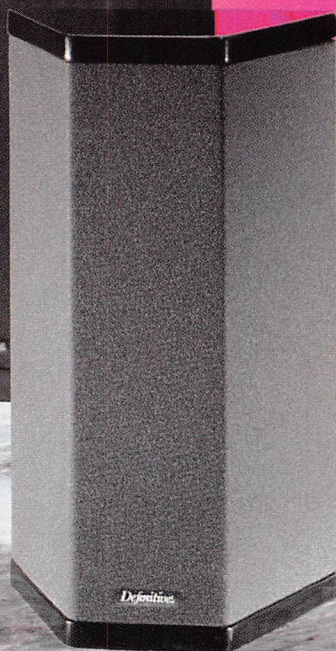
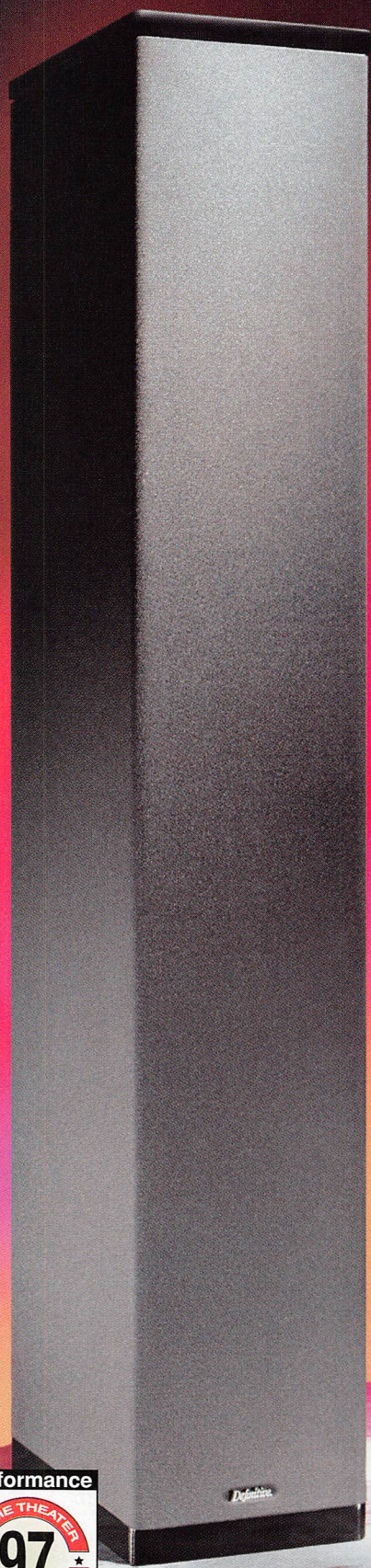


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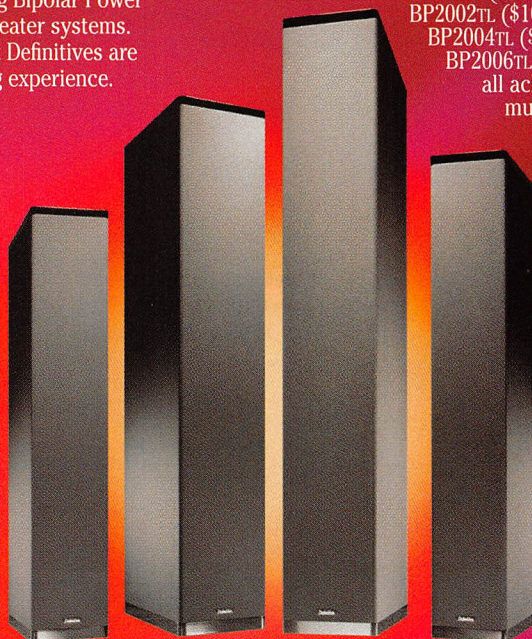
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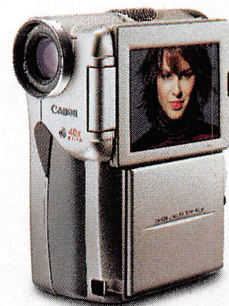
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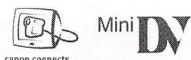
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LISTEN AND YOU'LL SEE





## track one

# Answering Summer's Call

**S**he was standing in the middle of a bustling corridor leading to New York City's Port Authority bus terminal, pacing back and forth with a cell phone pressed against her ear. I watched in amazement from a nearby newsstand as this woman — oblivious to her surroundings — fielded calls while harried commuters maneuvered around her: "Uh, could you hold on a minute? Hello? Hey, John. Listen, I've got Laura on the other line — can I get back to you? Great. I'll call you later. . . ." As I walked away to catch my bus, she was moving in a semicircular pattern, motioning with her free arm.

Happy to find no line at the bus gate, I climbed aboard, settled into my seat, and opened the newspaper for a nice, relaxing ride home. Just as the bus was about to pull away, some loud-mouthed fool with a cell phone pressed against *his* ear jumped aboard and sat across the aisle from me. He yakked nonstop for most of the 45-minute trip, taking and making one meaningless call after another, distressed that his evening plans weren't coming together. You'd think he was sitting in his kitchen — not a confined space with 40 or so other people.

You've probably figured out by now that I'm not a big fan of cell phones. Actually, it's not so much the phones I have a problem with as the inconsiderate ways many people use them. So I was more than a bit skeptical when one of my colleagues wanted to add a "really neat little MP3 cell phone" to the list of portable gear we were evaluating for "Summertime Cool" (page 68). But once I had a chance to play with it, I was struck by how cool it was to have a cell phone *and* an MP3 player rolled into one handheld device. And when I plugged the earbuds into the phone and hit the play button (well, it's not quite that simple . . .), I was impressed by the crisp, full-bodied sound I heard. While it's debatable how much this sort of dual functionality is worth — as you'll see when you read the article, this is *not* a cheap cell phone — there's no question that many multitasking cell-phone addicts will find it attractive. At the very least, it may have the positive effect of reducing their talking time while they take breaks to listen to music.

Beyond the MP3 phone, we put nine other cool gadgets through their paces in "Summertime Cool," including the first portable DVD system that can play DVD-Audio discs, a digital camcorder with a super-spy "zoom" microphone and infrared night-photography mode, and a writswatch camera, which has no real reason for existing except that it's loads of fun. When I went around the office one afternoon taking candid

snapshots of co-workers, everyone was intrigued by the little Dick Tracy camera.

Also in this issue, Mike Gaughn brings you the latest news on the Super Audio CD format, which until just a few months ago was a strictly high-end, two-channel affair. In a move that surprised many people back in January at the big Consumer Electronics Show (CES), Sony announced that it would not only (finally) start selling players that take advantage of the format's *multichannel* capabilities, but would do so at mass-market prices. (Witness Ken Pohlmann's report, page 39, on a five-disc SACD changer that lists for \$400.) Why did Sony wait two years to offer multichannel players? Does this mean war with the rival DVD-Audio camp? For answers to these and other questions, as well as a complete run-down on the format and what it has to offer, don't miss "Super Audio CD Goes Surround" (page 74).

There's plenty more to get excited about in this issue. Looking for some ideas on how to put a home theater together? In "All Systems Are Go!" (page 82), our Gear Guy recommends component groupings for three very different domestic environments. Ever wonder what it would be like to have quick, easy access to music in every room of your house — or at least in rooms apart from your main system? (Boomboxes don't count!) In "Sound All Around" (page 93), pro installer John Sciacca helps you get a handle on what multiroom audio is all about and how it might fit into your life.

Among the products tested this month are home theater speaker systems from two well-known and respected Canadian speaker makers, Paradigm and PSB, an inexpensive DVD player from Yamaha, Princeton's latest HDTV monitor, and the first receiver (from Onkyo) to include Dolby's new Pro Logic II surround sound decoding system, which is designed to bring a new dimension to Dolby Surround and stereo recordings. And speaking of testing, in "Behind the Numbers" (page 88), technical editor David Ranada takes you into his lab for an in-depth look at how we test DVD players. We hope it'll give you a better understanding of how our measurements relate to DVD audio and video performance.

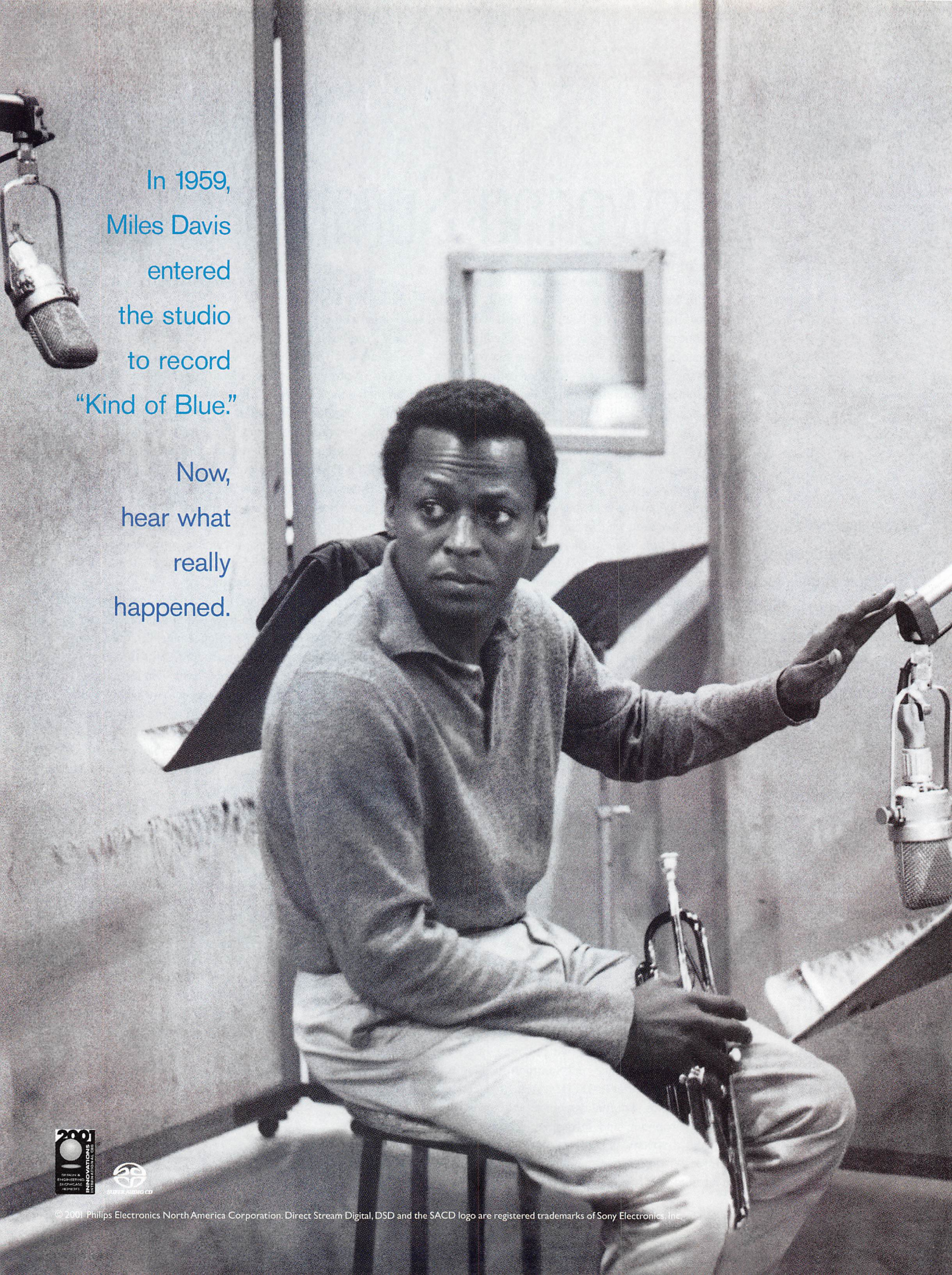
Finally, we're trying out a new department, "S&V Picks" (page 128). Please let us know what you think of it. Enjoy your summer!

Bob Ankosko, Editor in Chief

**From cool portables  
to the latest in  
surround sound, we  
evaluate the  
summer's hottest  
entertainment gear.**







In 1959,  
Miles Davis  
entered  
the studio  
to record  
"Kind of Blue."

Now,  
hear what  
really  
happened.



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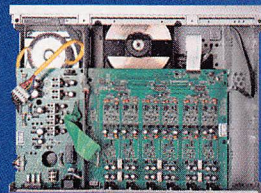


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*The dual-layer hybrid CD.*

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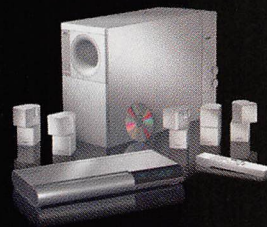
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JULY/AUGUST 2001

# SOUND & VISION

WHERE **TECHNOLOGY** BECOMES **ENTERTAINMENT**

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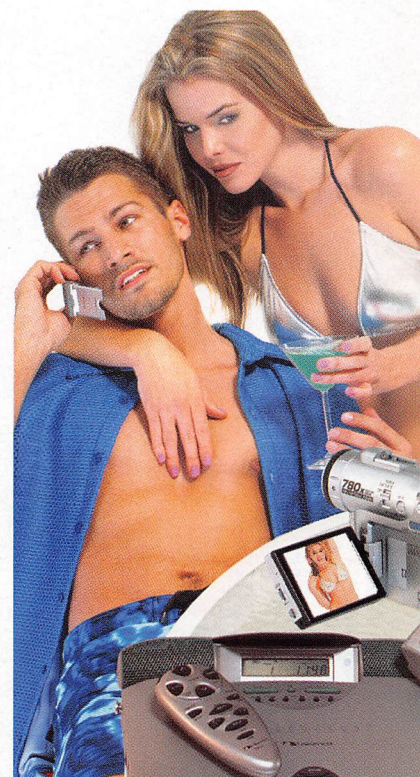
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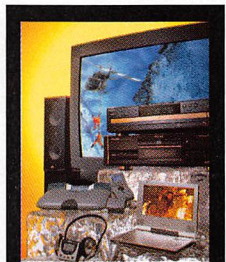
Everything you need to know about getting your home ready for multiroom audio. **BY JOHN SCIACCA**



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Photo by Tony Cordoza.

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*Building Excitement.*



COME TO YOUR SENSES. *See* beyond the facades...intriguing as they may be. *Hear* instead the music and laughter that pours out from them. *Smell* the infinite possibility that comes with breaking ground. *Touch* the buttons... and expect to be elevated. *Taste* the electricity pulsing in the air...your own story a welcome addition.

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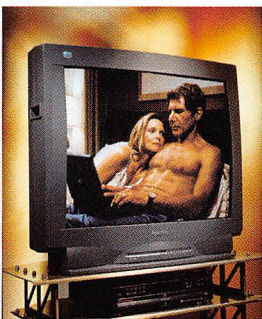
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## TEST REPORTS



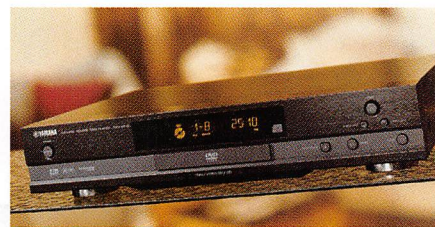
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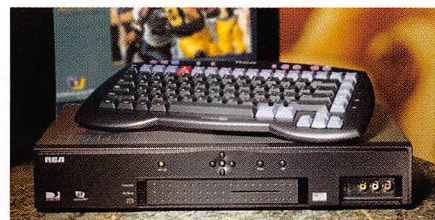
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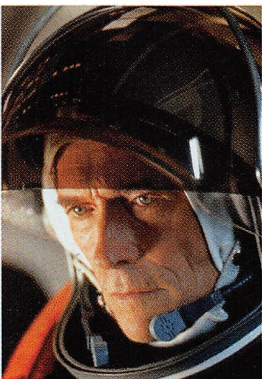
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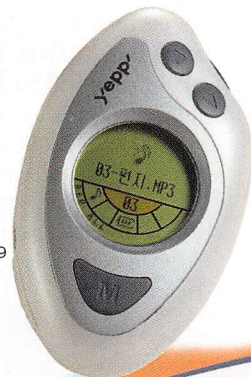


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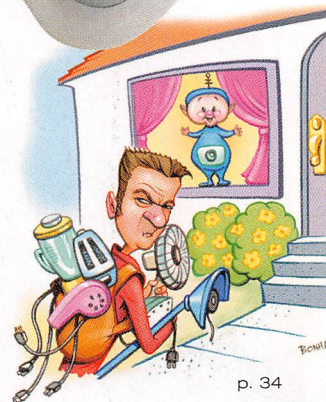


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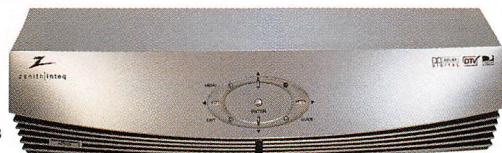
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# randomplay

EDITED BY BRIAN C. FENTON



## Really Compact Discs

There have been pocket-size 3-inch CDs since the format's earliest days — they were intended to replace 45-rpm singles. Though the format never became very popular, check any CD player's disc tray, and you'll find a cutout for the little discs. Now there's a new round of portable players that will accept *only* 3-inch CDs — including those containing MP3 music files. Shown above is the palm-size Philips eXpansion 401, which is said to be compatible with AAC files as well as MP3s and is due out

this fall at a price below \$200. Compaq recently previewed a similar product from its iPaq line. Compatible with MP3 and Windows Media Audio, it's expected to hit store shelves this fall with a price tag under \$100.

## After Napster, What?

With Napster's future in flux and music downloads more popular than ever, plenty of people are wondering what will be online music's Next Big Thing. Hoping to smoke it out, a herd of dot-com survivors, indie musicians, and a frightening number of lawyers gathered at Madison Square Garden in April for the third annual New York Music and Internet Expo. Some decided everyone already has the next Napster, and others concluded no one does.

Among the contenders: rent-to-own 30-day downloads, subscriber-based peer-to-peer networks, and burn-your-own-CD services. Virtually all the scheduled speakers at the Expo agreed 1) that the popularity of music downloading can only increase and 2) that the five major

record labels are way behind the curve in setting up workable online distribution.

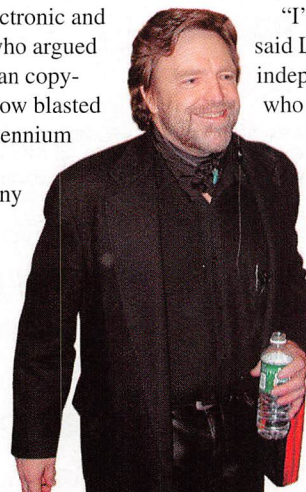
William Dobishinski, a copyright lawyer for 15 years, argued that the entertainment industry has to shift from selling goods (discs and tapes) to selling services (download privileges, copying privileges, subscriptions, and so on). "The more simple we can make [downloading music], the better it will be."

Shown in the photo below is keynote speaker John Perry Barlow — former Grateful Dead lyricist and founder of the Electronic Frontier Federation, which defends individual rights in the electronic and online age — who argued against draconian copyright laws. Barlow blasted the Digital Millennium Copyright Act, declaring that any artist who encodes his music with copy-prevention schemes like those promoted by the Secure Digital Music

Initiative (SDMI) will be making it inaccessible to future generations.

Although the event was dominated by "free the data" philanthropists like Barlow, guardians of copyright were present as well. For instance, Tim Smith of Copyright.net clashed with fellow panelists during a discussion called "Show Me the Money! Getting the Artists Paid." Smith favored free limited-use downloads that expire after a set time unless purchased, while others, like Trish Naudon of Digital World Services, supported subscription-based music networks.

"I'm glad I came," said Lori Wagner, an independent songwriter who flew in from Las Vegas on her own dime. "But I thought a lot of the speakers went off on tangents. They avoided how you can get things done." Yeah, like *they* know . . .  
— Peter Pachal



**EXTRAS!  
EXTRAS!**

## Thirteen Days \$27 (New Line)

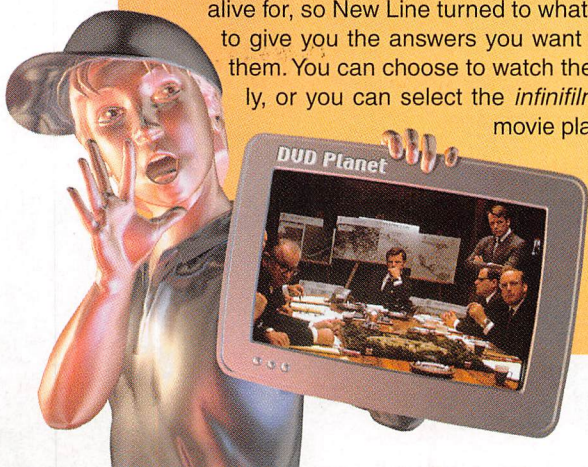
This sweaty-palm behind-the-scenes drama about the 1962 Cuban missile crisis launches New Line's *infinifilm* navigation and content system. Even a 145-minute thriller can't directly answer every question raised by a reconstruction of a historical event many viewers weren't alive for, so New Line turned to what it calls *infinifilm* to give you the answers you want when you want them. You can choose to watch the movie normally, or you can select the *infinifilm* mode. As the movie plays, key phrases

appear in subtitles. Click on one of these using your remote's cursor and enter keys,

and it activates a pop-up navigation menu. Make a selection from that, and the movie will pause while the disc presents supplementary material.

You can also choose to watch the historical and other extras from the main menu. They include a commentary track made up of archival interviews with President John Kennedy; the son of his nemesis, Soviet leader Nikita Khrushchev; his Secretary of Defense, Robert McNamara; and others plus a 48-minute documentary exploring the origins of the Cold War through archival footage, interviews, and expert analysis. There's also the usual filmmakers' commentary, a making-of featurette, deleted scenes, and a DVD-ROM-accessible script-to-screen feature. To sort out all the major players mentioned in the film and supplements, there are also 17 short (1- to 3-minute) biographical clips. If you watch not only the movie but also everything else included on the DVD, you could stretch *Thirteen Days* into 14.

— Josef Krebs





## A/V Digest

● Panasonic has announced the first combination DVD-R/DVD-RAM computer drive, which can record both write-once and rewritable discs. It's slated to hit stores this summer for less than \$1,000. This should put DVD-RAM on a stronger footing in the coming war with rival formats DVD-RW and DVD+RW.

● Zenith says it has developed a new modulation scheme for high-definition TV (HDTV) that's said to provide better over-the-air reception of HDTV than the existing 8-VSB modulation method — even for indoor and portable applications. Called E-VSB, the new scheme is compatible with 8-VSB, and a broadcaster can use both simultaneously. Is this an admission that 8-VSB wasn't perfect after all?

## Satellite Climbs Upward

If it seems like more and more little dishes are popping up in your neighborhood every day, you're not imagining it. The Satellite Broadcasting and Communications Association reports that there are some 16.5 million satellite subscribers in the U.S. today — that's more than 15% of all households nationwide. DirecTV, with 9.8 million subscribers, has an almost two-to-one lead over EchoStar's Dish Network. And there are still more than a million subscribers hanging onto their big-dish C-band systems.

In most states (shown as

# 15 Minutes with Chris Martin of Coldplay

*It's always nice when the good ones cut through the dross. Case in point: the admirable ascension of London's Coldplay, which has built an appreciative following with its Gold-selling debut album, Parachutes (Nettwerk/Capitol). This disc has all the makings of a future classic as its songs swing from light balladry to intense jamming in the turn of a friendly chord. It's thrilling to hear how beautifully singer and chief songwriter Chris Martin's falsetto wavers during the quieter passages of songs like "Shiver" and the radio hit "Yellow" before he and his bandmates turn on the crunch.*

Martin, 24, politely rebuffs any accolades, though: "I think our strength is not being sure if we're ever good enough, and so we're always trying to write a better song — or get a better suit." This interview was conducted via e-mail while Martin rested his voice between tour dates in Europe before Coldplay hit U.S. shores for a summer tour. (Happy landings, gents.) — Mike Mettler

## Did you ever dream of having your record received so favorably in the U.S.? What does America represent to you?

America is always the stuff of legend to British bands because it's just so massive. But I'm glad we can go [on tour there] since all of our favorite music comes from there, like Bob Dylan and the Pixies. I always imagined myself supporting Bob Dylan at Madison Square Garden with Woody Allen on clarinet and Muhammad Ali handling security. Also, although it sounds cheesy, I just read *On the Road* by Jack Kerouac, and I can't wait [to go back to the States].

## Speaking of Dylan, any perspective on his turning 60 in May?

Well, Bob Dylan is king of the music world, and I can't go on about him enough. Age 60 is no problem; I don't think he'd worry about it, so I won't either. He's so good that I always

sound like a tacky infomercial when I talk about him. But I used to think he was rubbish until I saw [the 1967 documentary] *Don't Look Back*, and then I realized I was a fool.

## What makes good songs good?

Songwriting is the crux, but the best records — from Radiohead and Björk to Tom Waits and Neil Young — are those where the sounds fit the song. There's no use putting amazing techno sounds on a song that just needs to be played on a blues harp;

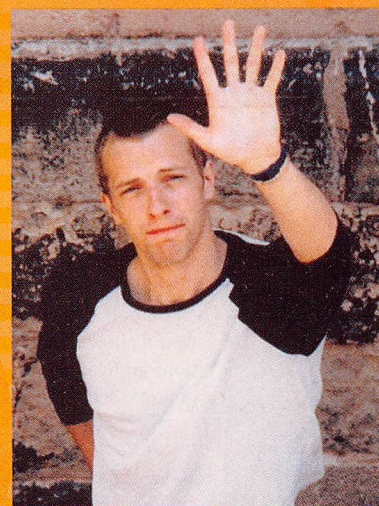
similarly, there's no point in having a nice oboe sound on a Nirvana record. But I'm not pretending to be an expert, because I sometimes hear our stuff and think, "Ecch."

## What's your take on MP3?

I think MP3 is great because you can hear stuff for yourself and then decide whether you want to buy it. I think Napster is great, too. People who want to buy records always will, anyway. I think there's a load of nonsense talked about it; cassettes have been around for ages, and nobody's been too damaged by [home-made cassette copies].

## Has Coldplay been directly affected by downloading?

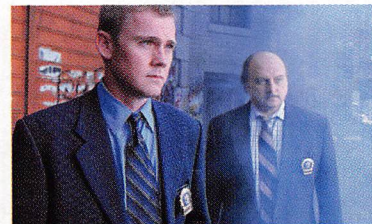
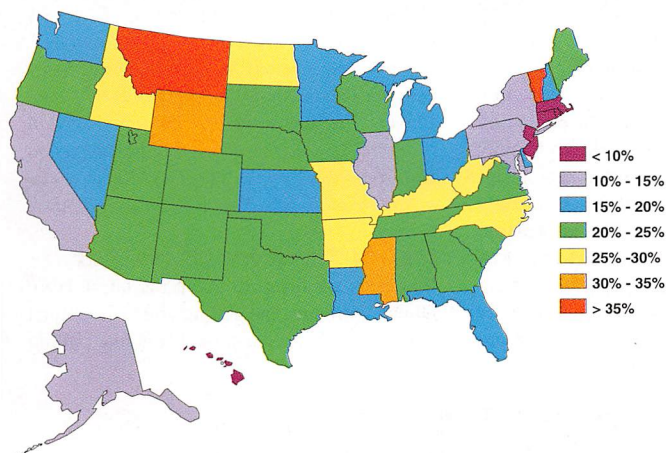
I don't think we've done anything but gained by it; the only time I'd ever have a problem is if there was stuff on the Net that we hadn't wanted anybody to hear. That's the only bad thing about it.



TOM SHEEHAN/NETWORK

green and yellow on the map below), between 20% and 30% of the homes receive their TV

via satellite. Fewer than 10% of the homes receive satellite TV in only five states: New Jersey, Massachusetts, Rhode Island, Connecticut, and Hawaii. Leading the nation are Vermont and Montana with 41% and 39% of homes, respectively. In terms of sheer numbers, Texas, with 1.7 million homes, has more satellite viewers than any other state, followed by California, Florida, North Carolina, and New York.



To fully appreciate Sipowicz's pockmarks and Sorenson's dimple, you have to watch *NYPD Blue* on HDTV. The 15th Precinct not only looks convincingly grimy, but its Dolby Digital mix sounds authentic, too. (Tuesdays at 10 p.m. on ABC)



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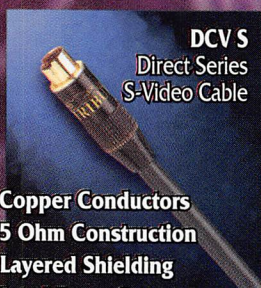
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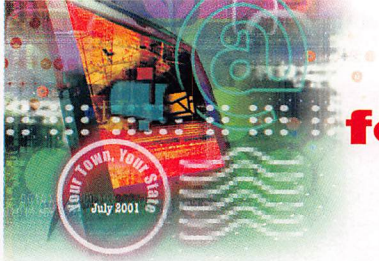
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## feedback

### Multichannel Outputs

At last! Multichannel Super Audio CD has arrived. Best omission: the kind of "extras" that clutter up the DVD-Audio releases. Maybe SACD is about *music*! Worst omission: no digital output, just like DVD-Audio (and just as bad). The lack of digital outputs is the main reason I'm not buying into these new formats, even though I've been waiting for multichannel surround sound since hearing its first incarnation in the 1970s. Having digital outputs for all multichannel audio sources would allow more flexible equipment connections and get us away from today's ludicrous multiple sets of outputs.

**Wayne Erling**  
Miramar, FL

### The Ups and Downs of High-Def TV

Thought you might be interested to know that I just started getting 1080i-format, wide-screen 16:9 high-definition TV (HDTV) via Time Warner *cable* in the Minneapolis area — just HBO and Showtime for now. The Scientific Atlanta Explorer 2000-HD cable box I'm using is included in the subscription price. The picture on my TV, using component-video cables, is brilliant. My Onkyo receiver is connected to the set-top box via coaxial cable. Sound for the HDTV channels is very good, and it appears to be Dolby Digital 5.1.

**Andy Voit**  
Shakopee, MN

*Consider yourself lucky. There are still issues to be resolved between the consumer-electronics, cable, and motion-picture industries — including copy protection, device interfaces, and must-carry rules — before HDTV over cable becomes commonplace.*

After reading up on HDTV in your magazine, I decided that the time had come to upgrade. As I was perusing the options in a local megastore, however, I noticed an HDTV set next to a standard TV. Same brand, same size, same program material. But the HDTV's picture looked like crap compared with the standard TV's. Same thing in another store. No wonder the technology hasn't taken off.

I suppose it's because the finer-resolution HDTV sets display flaws that are hidden by the old video standard, but it doesn't really matter why. The picture quality of analog signals displayed on HDTV sets is completely unacceptable.

**David McNeill**  
Watertown, MA

*As we've pointed out in the past, HDTVs are often set up improperly in stores, especially electronics superstores, so be cautious about*

*any judgments based solely on that kind of experience. Nonetheless, most HDTVs "up-convert" standard analog video signals to a 480p (progressive-scan) display format. While this process often generates undesirable picture artifacts, the result certainly isn't unacceptably bad on all HDTVs. In any case, the manufacturers are beginning to make improvements in upconversion quality.*

### S&V Bares All

Was it really necessary to have a barely covered nude woman grace — or disgrace — the cover of your May issue? It lent a certain cheapness to an otherwise fine periodical that can do without the titillation others use to sell their wares. I'm sure many readers will still find **Sound & Vision** informative and entertaining without the *Playboy* factor.

**Randall Collins**  
Omaha, NE

As soon as I opened the mailbox and saw your May issue, my reaction was, "Wow! What a great cover." Mating the Eve/Apple/Snake theme with the DVD players was a stroke of genius, and Jayme Thornton did a masterful job with the photo illustration. It's true that his cover art and equally nice art for the "Garden of DVD" feature don't add much "content," but as teachers found out many years ago, first you have to get their attention.

**Mike Guillory**  
Houston, TX

### Missing DVD Players

I'm in the market for my first DVD player, and Peter Pachal's "DVD for All" guide to players \$1,000 or less (May) seemed written just for me. One problem: the players I'm interested in, namely those with a progressive-scan output (for example, the Panasonic DVD-RP91 and Yamaha DVD-S1200), are nowhere to be found on the manufacturers' Web sites.

**Lee Clark**  
via e-mail

*Web sites are often unreliable, and there may be no way to tell when they were last updated. Nevertheless, in early May we were able to locate the Panasonic DVD-RP91 in the "Home Players" listings in the "DVD-Audio" section (not "DVD-Video") of [www.panasonic.com](http://www.panasonic.com). Unfortunately, Yamaha's DVD-S1200 won't be available until July. That was an oversight.*

### Equal Time for EchoStar

You guys always gush about the latest TiVo/DirecTV product, but getting you to give equal coverage to EchoStar products is like pulling





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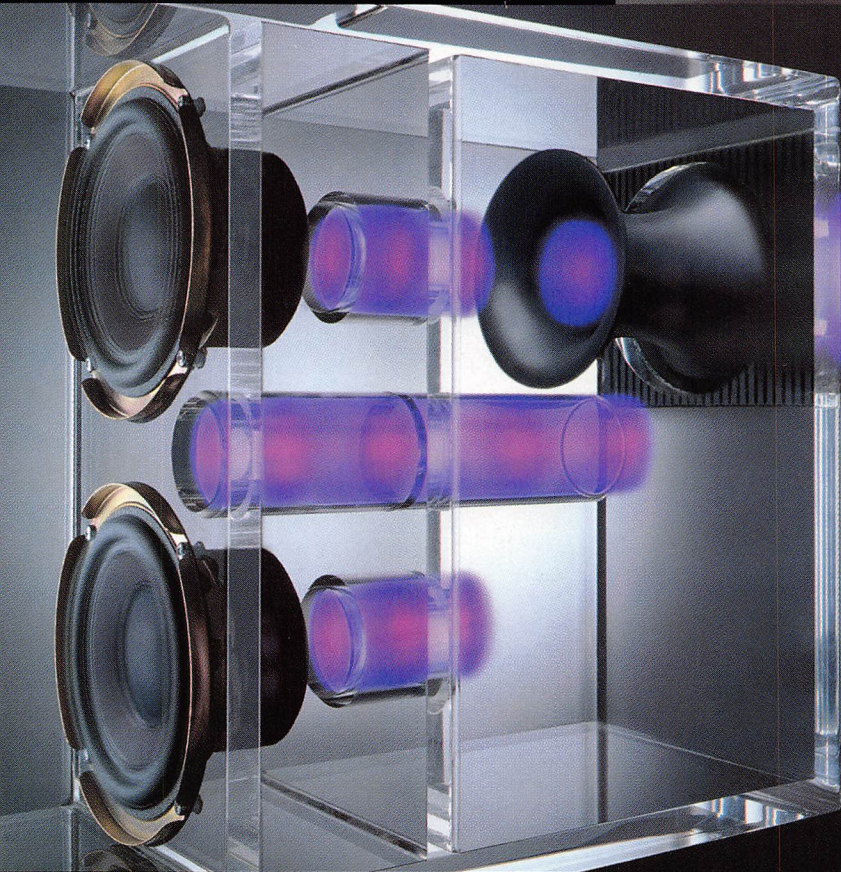
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## feedback

teeth. If you want to run a test report on the Philips DSR6000 receiver/recorder (May), fine. But EchoStar's new PVR 501 does everything the DSR6000 does, with a 40-gigabyte hard drive for 30 to 35 hours of recording time. And the Dish Network programming is, channel for channel, less expensive than DirecTV's. The Personal TV feature won't cost you \$9.95 a month extra, either.

**Eric Chaffin  
Moore, OK**

*Our coverage hasn't shortchanged EchoStar. In July/August 1999, we reviewed the Dish-Player 7100, the first satellite receiver with an integrated hard drive. Last year we reviewed the Model 5000 and later the Model 6000, which can also receive HDTV. We hope to review the PVR 501 in a future issue.*

### Component-Video Flavors

In his review of the Sony KP-65XBR10W HDTV monitor in May, Al Griffin bemoans its single "wideband" component-video input, since the other component input isn't adequate for progressive-scan DVD signals. Mitsubishi, Pioneer, ProScan, and Hitachi HDTVs all have variously labeled component-video inputs said to be usable for 480p (progressive) signals, but there's no mention of "wideband." My Onkyo receiver has component inputs and outputs the company says are for HDTV signals, but it provides no other specs for them. What gives?

**Casey Matthews  
Beaumont, TX**

*Al Griffin replies: As you've discovered, equipment makers haven't settled on uniform nomenclature for the various flavors of component-video jacks. We call component inputs "standard" if they accept only standard 480i (interlaced) analog signals, "wideband" if they can also handle 480p (progressive) and high-definition digital signals. When you're shopping for an HDTV (or an A/V receiver, for that matter), you need to ask which signal formats each set of component-video jacks can pass. That's the only way to avoid surprises when you get home and hook everything up.*

### Correction

"Shopping Made Simple: Direct-View TVs" in April inadvertently omitted sets from Samsung. For full information about Samsung's line of digital and analog TVs, go to [www.samsungusa.com](http://www.samsungusa.com), or call 800-726-7864. **S&V**

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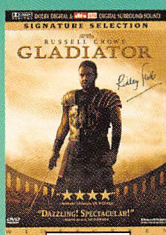


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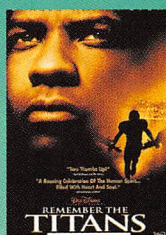
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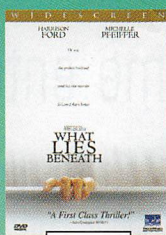
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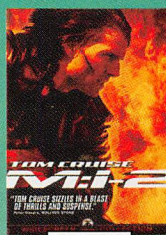
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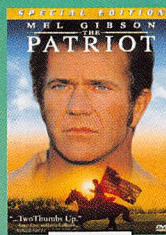
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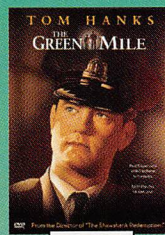
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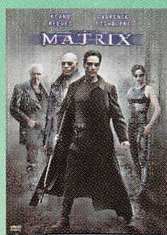
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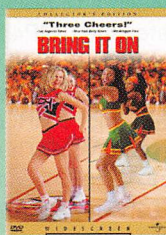
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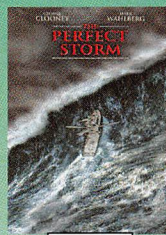
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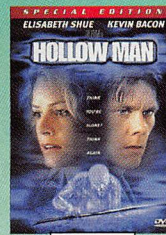
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# new products

Hot gear from the world of home entertainment



## Hitachi

FHP, a joint venture of Fujitsu and Hitachi, has donated some plasma to Hitachi's UltraVision TV line. Inconveniently designated the CMP4120HDUS, the 42-inch, 3½-inch-deep widescreen HDTV can accept 1080i, 720p, 480p, and 480i signals through its high-definition inputs, which include RGB+H/V, wideband component video, and VGA. The screen has a resolution of 1,024 x 1,024 pixels, and its contrast ratio is rated as 700:1. Three color-temperature presets (6,500, 7,600, and 9,300 K) and three aspect ratio settings (Normal, Full, and Zoom) let you adjust the picture to your taste or the program material. Price: \$10,000.

800-448-2244, [www.hitachi.com/tv](http://www.hitachi.com/tv)



## Denon

If you're ready for DVD-Audio, Denon's DVD-3300 is ready for you. The single-disc player has six 24-bit/192-kHz digital-to-analog converters to decode DVD-Audio discs as well as an audio-only mode that turns off all video circuitry for interference-free playback. Of course, it's also a fully functional DVD-Video player and has onboard Dolby Digital and DTS decoding for movie soundtracks. Component-, composite-, and S-video outputs are your video hookup options. The player also features virtual surround sound for headphone listening. Price: \$1,199. 973-396-0810, [www.del.denon.com](http://www.del.denon.com)



## Definitive Technology

The new PowerMonitor series from Definitive Technology gives full-range-speaker shoppers a lot to choose from. The PowerMonitors 500, 700, and 900 are all three-way speakers with built-in powered subwoofers. With 8-inch drivers for the PM 500 and 700, and a 10-incher for the PM 900, low-bass capability is rated all the way down to 22, 20, and 19 Hz, respectively. They all have 1-inch tweeters rated out to 30 kHz, and their midrange drivers range in size from 4½ to 6½ inches. Cabinets are between 14¾ and 18¼ inches high and finished with black piano-gloss top and bottom and wraparound grilles. Prices per pair: PowerMonitor 500, \$850; PM 700, \$1,200; PM 900, \$1,600. 410-363-7148, [www.definitivetechology.com](http://www.definitivetechology.com)



## JBL



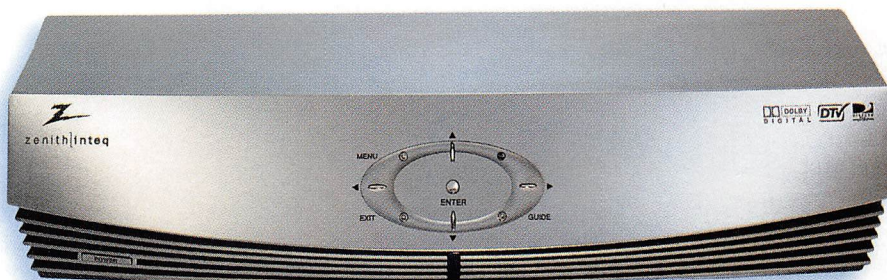
You can jump from a simple TV to a 5.1-channel home theater system just by adding the JBL Cinema ProPack 600. The system comprises a five-disc DVD changer, a digital surround receiver, five satellite speakers, a subwoofer, and a full-function remote control. The DCR600 receiver is rated to deliver 100 W x 5 and can decode MP3 signals. The two-way satellite speakers have 1/2-inch titanium tweeters and 3-inch woofers (the center speaker has two of the woofers), while the powered sub has an 8-inch driver and a 100-watt amplifier. CDs and CD-RWs will play in the DVD changer, and the programmable remote can control up to eight devices. Price: \$1,199. 516-496-3400, [www.jbl.com](http://www.jbl.com)

## JVC



You don't have to be afraid of the dark with JVC's GR-DV915 MiniDV camcorder. The cam's NightAlive function (keep working on those names, guys) is said to let you shoot in full color even when light is scarce through a combination of signal processing and a slow shutter speed. There's also a built-in Auto Light that can turn itself on in darkened conditions. You can transfer video through the IEEE 1394 digital input/output or via composite/S-video connections. The cam has a 3 1/2-inch LCD viewscreen and a color viewfinder. Its 680,000-pixel image sensor can capture still photos, too, storing them on the supplied 16-megabyte MultiMediaCard. Price: \$1,196. 800-526-5308, [www.jvc.com](http://www.jvc.com)

## Zenith



One of the most reliable sources of high-definition TV programs is a satellite service, and Zenith's IQCDTV1080 tuner can bring DirecTV's high-def programming to you. It receives standard- and high-def digital satellite and terrestrial broadcasts and can supply 1080i, 720p, 480p, or 480i format signals, with automatic aspect ratio correction, through its VGA or wideband component-video outputs. It passes multichannel soundtracks through its optical and coaxial digital audio outputs. Price: \$699. 847-391-7000, [www.zenith.com](http://www.zenith.com)

**NOTE** All prices and product information are supplied by the manufacturers. Dealer prices may vary.





## Cerwin-Vega

Besides an 8-inch rear-firing powered subwoofer, Cerwin-Vega's floor-standing RL-18P power tower has a 6-inch midrange and a 1-inch tweeter. Rated frequency response is 35 Hz to 20 kHz  $\pm 2$  dB, sensitivity 92 dB. The sub has both line-level and speaker-level inputs, and its amp is rated at 100 watts. Magnetic shielding prevents interference with video monitors. The RL-18P measures 10 x 43½ x 14½ inches and is finished in black woodgrain vinyl. Price: \$1,000 a pair. 805-584-9332, [www.cerwinvega.com](http://www.cerwinvega.com)



## Onkyo

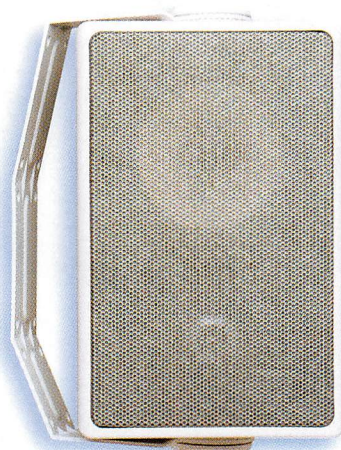
Dolby Pro Logic II, intended to simulate 5.1-channel depth with Dolby Surround-encoded and plain stereo program sources, is onboard Onkyo's TX-DS595 digital surround receiver. Rated to deliver 75 W x 5, the receiver also has nine ambience modes. Its extended frequency response, rated out to 100 kHz, is said to accommodate DVD-Audio discs and Super Audio CDs. On the back panel are four assignable digital audio inputs (two coaxial and two optical), video and audio tape loops, four S-video inputs, and a six-channel analog audio input. A backlit universal learning remote control is supplied. Price: \$530.

800-229-1687, [www.onkyousa.com](http://www.onkyousa.com)



## Harman Kardon

Digital convergence now gives us Harman Kardon's DMC 100 Digital Media Center, combining a DVD-Video player, a 30-gigabyte hard drive, and Internet connectivity in one 17¼ x 4¾ x 13½-inch chassis. Controlled by a 566-MHz Intel Celeron processor, the device can play MP3 or Windows Media Audio files. Broadband and dial-up connectors enable Web browsing and e-mail using the wireless keyboard. A subscription to the ZapMedia service (\$9.95 a month) is required for full functionality. There's a front-panel USB port, and the back panel has a coaxial digital audio output, composite- and S-video outputs, and a VGA output. Price: \$899. 516-496-3400, [www.harmankardon.com](http://www.harmankardon.com)



## Parasound

Does your music need to get out more? Parasound's Outsiders can get it at least as far as the yard. There are two speakers: the Outsiders S (small), with a 4½-inch Kevlar woofer, and the Outsiders L (large), with a 5¼-inch woofer. Both have 1-inch aluminum-dome tweeters. Rated frequency response extends to 22 kHz, though the S bottoms out at 58 Hz while the L gets down to 50 Hz, both  $\pm 3$  dB. The durable cabinets are made of mineral-filled polypropylene, with stainless steel grilles and mounting hardware. Prices: L, \$450 a pair; S, \$250 a pair.

415-397-7100, [www.parasound.com](http://www.parasound.com)



# SHARP LCD TV

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Beyond the limits of space. Beyond traditional thinking. Sharp LCD flat panel TV. LCD's the key. Sharp's legendary LCD technology provides brilliant picture quality that transcends conventional television. And lets you enjoy the picture from virtually any viewing angle. A mere 2 inches thin, Sharp's line of flat panel TVs are ergonomically designed to hang on walls. Under kitchen cabinets. Anywhere in your home. Freeing you from the constraints of the past and opening up unlimited viewing possibilities for the future. Sharp LCD TV. No boundaries.



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# new products

## Kenwood



Part of Kenwood's premium Sovereign line, the VR-5900 receiver is THX Ultra-certified and features Dolby's improved Pro Logic II surround decoding. It also has onboard video-conversion circuitry to handle all video formats — even HDTV — which means you need only one connection to your TV set. The amplifier is rated to deliver 130 W x 5, and decoding circuitry can handle Dolby Digital, Surround EX, and DTS-ES Discrete surround sound formats. There are seven coaxial and seven optical digital audio inputs and a six-channel analog input. An RF/infrared touchscreen remote is supplied. Price: \$3,000. 310-639-9000, [www.kenwoodusa.com](http://www.kenwoodusa.com)

## Jensen

Besides including a CD player and an AM/FM radio, Jensen's IC8010 Intellicar in-dash head unit has a single auxiliary input on the back. But add the optional Source Selector (\$180), and you can control up to four separate A/V components and feed video signals to up to three monitors (ideal for families who *really* can't agree on anything). The onboard amp is rated to deliver 60 W x 4, and there are two pairs of preamp outputs. A multicolor LCD readout and flip-down detachable face give the Intellicar beauty as well as brains. Price: \$250. 800-677-6863, [www.jensenaudio.com](http://www.jensenaudio.com)



## Lightning Audio

The Bolt line of amplifiers from Lightning Audio comprises five models: the B.150.2, B.200.2, and B.300.2, which can be configured for one or two channels, and the B.300.4 and B.400.4, which can feed two or four channels. Rated power ranges from 50 to 200 watts per channel. Every Bolt amp has a variable crossover filter switchable for high-pass, low-pass, or all-pass operation. An optional cooling turbine plugs into the top of your amp to keep the circuit board from frying. Prices: \$119 to \$229; cooling turbine, \$30. 480-966-8278, [www.lightningaudio.com](http://www.lightningaudio.com)

## Bose

Alone, it's a simple AM/FM table radio, but once connected to your computer's serial port, the Bose Wave/PC system opens up a whole new world of digital music. Its credit-card-size remote control lets you choose from regular AM/FM stations, Internet radio, CDs in your PC's CD-ROM drive, and music-file playlists. The supplied software lets you create MP3s and burn your own CDs. The Wave/PC requires at least a Pentium II-based PC running Windows 98. A USB-equipped version is slated for the fall. Price: \$449. 800-444-2673, [wavepc.bose.com](http://wavepc.bose.com)





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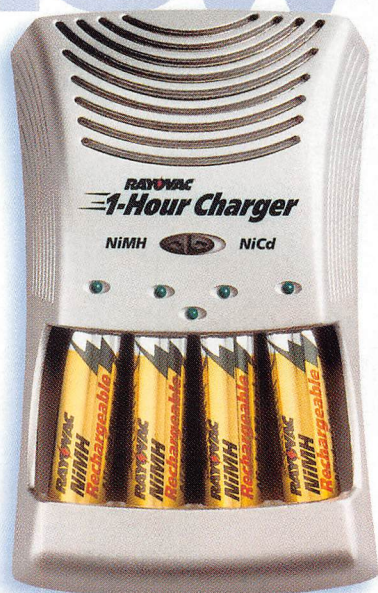
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# new products



## Rayovac

The Rayovac 1-hour charger can put energy back into your batteries almost as fast as you can use it. In the time it takes to watch *60 Minutes*, the Rayovac can recharge four drained AA or AAA nickel-metal-hydride (NiMH) or nickel-cadmium (NiCd) batteries. It can refresh 9-volt batteries, too, but they take 2 to 3 hours. Detection circuitry makes sure there is no chance of overcharging, and green LEDs will flash if you put in nonrechargeable batteries by mistake. A DC car adapter is supplied. Price: \$30.

800-237-7000, [www.rayovac.com](http://www.rayovac.com)



## Aiwa

When is a portable MP3 player not an MP3 player? When it's playing a Windows Media Audio file, as the Aiwa MM-RX400 can do as easily as MP3 playback. Tunes in either format can be added through the USB port to the 32 megabytes (MB) of internal memory or the supplied 32-MB removable MultiMediaCard. If you get tired of listening to them, just switch on the built-in AM/FM tuner. The player weighs only 1½ ounces, measures 1½ x 3½ x ¾ inch, and comes with headphones. Price: \$400.

201-512-3600, [www.aiwa.com](http://www.aiwa.com)



## Imerge

Need a high-tech way to listen to your ever-growing CD collection? Sounds like you could use a digital music server like Imerge's S1000 SoundServer. It includes a CD player, but its 40-gigabyte hard drive can hold hundreds of hours of MP3-encoded music (you can also store your music uncompressed if you prefer). You control the 17½ x 4¼ x 15¾-inch device through onscreen menus via the supplied remote control. In addition to its USB and RS-232 interfaces, it has a built-in modem to access online CD title/artist information. Price: \$1,400; wireless keyboard, \$160. 703-481-9815, [www.imerge.co.uk](http://www.imerge.co.uk)



## Klipsch

Expanding sound in unexpected places: the Klipsch ProMedia 2.1 three-piece speaker system is ready to augment the sound of your personal computer, game console, MP3 portable, or anything else you want to connect to its minijack input. The THX PC-certified system comprises two satellites with 3-inch fiber-composite drivers and a powered bass module with a 6½-inch driver. A 200-watt amplifier built into the bass module powers all three speakers, and a "pod" with volume and bass controls attaches underneath one of the satellites. Price: \$179.

800-554-7724, [www.klipsch.com](http://www.klipsch.com)





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## Q&A IAN G. MASTERS

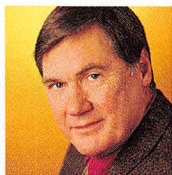
### Resolution Madness

**Q.** I'm confused about the resolution numbers that high-definition TV (HDTV) manufacturers quote. Some specify both a

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1,920 x 1,080 resolution and 1,200 lines of horizontal resolution. Some just specify 1,200, 1,400, or 1,600 lines of horizontal resolution. Which numbers tell me what I need to know?

**Richard Dittmer**  
Tucson, AZ



**A.** Resolution is one of those ultra-popular specs that few people — or even TV manufacturers — understand completely. Vertical resolution is easy since it's fixed by the number of scan lines: 480, 720, or 1,080. Horizontal resolution should

mean the maximum number of alternating black and white vertical lines that can be distinguished in a portion of the screen as wide as it is high. Many resolution specs are for the whole screen width, however, and are thus overstated. If the 1,920-line spec is for the whole screen, the actual resolution would be 1,080 lines. In fact, a 1,080-line HDTV signal has 1,920 pixels per line, leading to about equal resolution horizontally and vertically.

### To Sub or Not

**Q.** I'm converting an old rack system to a new home theater system. I already have full-range speakers with large woofers. Should I add a powered subwoofer and use my existing speakers for the front left/right channels, or should I opt for smaller speakers up front to complement the sub?

**Scott Hill**  
Kansas City, MO

**A.** While you could use your old speakers in your home theater, it's doubtful if the kind of speakers that were packaged with old rack systems will be able to do justice to the deep bass in movie soundtracks on DVD. Beyond that, you'd have to worry about making sure all the satellite speakers in the system are tonally matched for good surround sound performance.

You should seriously consider an all-new speaker system that includes a subwoofer. Besides providing a solid foundation for movies and music, you can position a separate subwoofer for the best bass in your room, which is probably *not* the same place where you'd put front left and right speakers for the best stereo and surround imaging. Then you can use your receiver's bass-management settings and the subwoofer's crossover and level controls to optimize the blend between the front speakers and the subwoofer.



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"... amazing ... remarkable realism ... unbelievably spacious ... clean and powerful ... three-dimensional ... neutral ... transparent. I was totally unprepared for the level of performance delivered by these speakers. Power handling, accuracy, detail, and imaging were all exemplary."

— Roger Kenno, SoundStager on the Monitor 9 which has been further improved for even better sound.

www.paradigm.com



So despite the temptation to recycle your existing gear, in this case it would make more sense to use your old speakers in a stereo system elsewhere and start fresh for your home theater.

### VHS Degradation

**Q.** When I moved over a year ago, I left a large group of movies on VHS cassettes, most between one and four years old, at a friend's house. They were stored at room temperature and were never touched during this period. I now find that the picture quality on almost all of the tapes has declined severely, rendering them unwatchable. Why did this happen, and is there anything I can do about it now? **Efrem Statter**

**Thornton, CO**

**A.** Unfortunately, once a videotape has been wrecked, there's usually not much you can do to salvage it. It's hard to guess what might have happened here, but any tape should be able to survive four years without a problem. I have a number of tapes more than 20 years old that play perfectly. There are certainly horror stories about tapes simply disintegrating on the shelf, but that happens almost randomly, involving quality-control problems with specific batches from different manufacturers. Un-

less your tapes were all one brand and all bought at the same time, that's unlikely to be the explanation. I can only think that there was something in the way they were stored that ruined them, and if it wasn't the climate (which, I trust, was not near the ocean, with its tape-hostile humidity), I would suspect a wayward magnetic field.

### Remote Interference

**Q.** I just bought two DVD players from the same manufacturer only to find that both infrared remotes work both machines. I press play, and both machines get going. I've been told that the only solution is to cover the infrared sensor on the machine I don't want to use. Is there a better way to overcome this problem than draping my shirt over the DVD player? **Scott Wade**

**Paget, Bermuda**

**A.** There's nothing much you can do to change the remote codes in the players. Try putting a piece of tape (not your shirt!) over one IR sensor. Or move the players far enough apart that you can aim the remote at one without affecting the other. Another option is to turn off the one you're not using at the moment; I can't think of many reasons to have two players going at the same time in the same room.

### Fighting CD Scratches

**Q.** I have been told that using toothpaste and a soft toothbrush will take scratches out of CDs. Is this true? **Paul Nizolak**

**Bridgewater, NJ**

**A.** No, no, and again, no! Most types of toothpaste are moderately abrasive, so I don't think I'd want them near my CDs. The chemicals in CD-polishing kits are much finer grade and may work on very light scuffing. Most scratches are fairly benign anyway, as CD error-correction circuitry can compensate for fairly large data disruptions. Radial scratches rarely cause problems, but concentric ones, caused by something touching the disc surface as it turns, can really mess things up. I've never found a reliable fix for them. **S&V**

If you have a question about audio, video, or home theater, write to Q&A, **Sound & Vision**, 1633 Broadway, New York, NY 10019; e-mail, [soundandvision@hfm.com](mailto:soundandvision@hfm.com). Be sure to include your name, street address, and phone number for verification; only your name, city, and state/country will be printed. Sorry, but only questions chosen for publication can be answered, and all letters are subject to editing.



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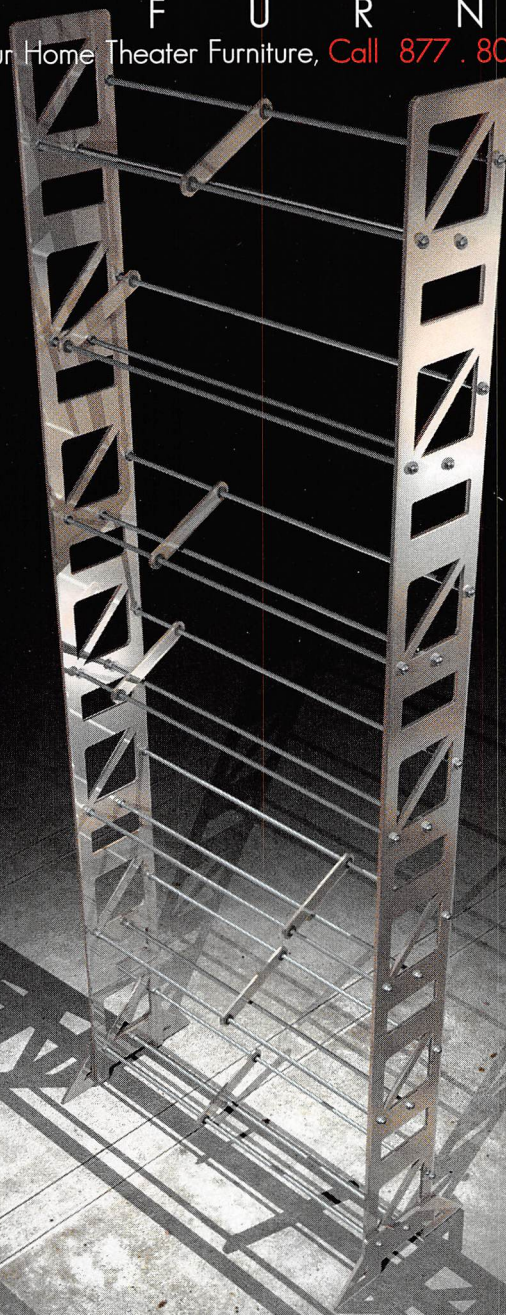
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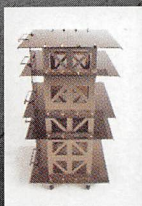
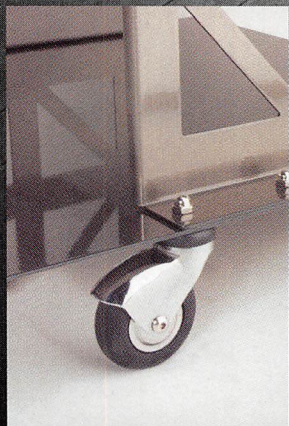
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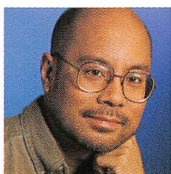


# Copy Code Reborn

**A** little more than 13 years ago the National Institute of Standards and Technology, or NIST (formerly the National Bureau of Standards), issued its damning report on what can now be viewed as the record industry's first serious attempt to protect its "product" (as record-company executives often refer to the creations of their artists) with a kind of sonic "watermark." Much to the relief of serious listeners, NIST found that the CBS-developed Copy Code system didn't work. Not only was it unreliable in operation — the most important flaw — but it made audible changes in the music.

The millennium has turned, we are at what is hopefully the dawn of the multi-channel audio era, and the record companies are at it again with the Secure Digital Music Initiative, or SDMI (www.sdmi.org). I keep hearing it as SDI, the Reagan-era

**An advanced hacker probably now has enough information to disable the DVD-Audio watermark.**



Strategic Defense Initiative against ballistic missiles (a.k.a. "Star Wars"), which also has its close descendants today. There are other parallels to be drawn between SDI and SDMI. The most important is that neither shows any sign of working properly — hardware solutions to what are basically nonhardware problems rarely do. SDI can be flummoxed by a deluge of missile decoys, and SDMI lies vulnerable to hackers. Knowing this full well, last November the SDMI folks boldly issued a public challenge to hackers to "break" several proposed data-protection technologies, one of which was already being used to watermark DVD-Audio discs. They made available on the Internet both watermarked and unwatermarked versions of the *same* program material — a fundamental error if you want to make it difficult to figure out a watermarking scheme.

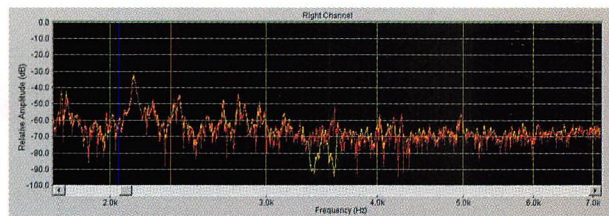
A prestigious group led by Scott Craver

of Princeton University, including researchers from Rice University and the Xerox Palo Alto Research Center, took up the challenge. The team of nine refused the paltry prize money and reserved the right to publish their findings on how they broke *all four* SDMI watermarking technologies. As it turns out, a warning letter from the SDMI Foundation caused the team to withdraw its "Reading Between the Lines: Lessons from the SDMI Challenge" from presentation at a scientific conference in April, but at this writing (in early May), a "leaked" or "unauthorized" version was still available online.

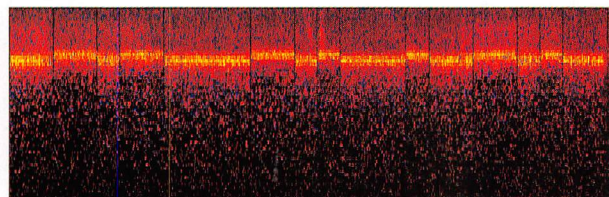
The scientists found that the DVD-Audio watermarking scheme, SDMI's Technology A, is an "echo hiding" system and also determined its "frame size" and "delay hopping pattern." They refer to a paper on techniques for breaking such schemes dating from 1962 (!) and give the U.S. patent number for technology related to DVD-Audio watermarking (#05940135). Armed with the patent, the Craver team's paper, and other public resources on echo-hiding watermarking, any advanced hacker probably now has enough information to disable the data-protection ability of the DVD-Audio watermark, if not undo its sonic consequences.

There's no doubt in my mind about the sonic consequences of SDMI's watermarking Technology B, however. Craver and his team found, and I've confirmed by my own measurements, that, like Copy Code, Technology B uses notch filters. This being the new millennium, the filtering is a bit more complex: The old analog Copy Code removed a single portion of the musical spectrum at a pitch near the top of a piano keyboard. It distinctly altered such passages as the final chord of Prokofiev's *Alexander Nevsky*, a fact I submitted to NIST to aid its investigation.

Technology B's notch filters occupy the same frequency region but seem to come in



**Figure A.** The notch filters of SDMI's watermarking Technology B show up clearly in these spectra at the same point in a piece of recorded music. Yellow trace is with watermarking, red trace without.



**Figure B.** Technology B's filters change their frequencies to carry watermark data, as shown by the yellow "stripe" in this spectrogram. Time runs horizontally and spans 2 minutes, and frequency runs from 20 Hz at the bottom to 20 kHz at the top.

two pairs. The double dip caused by one pair can be plainly seen in Figure A. Figure B shows the *difference* in frequency content between the watermarked and unwatermarked material; the undulating bright yellow trace shows when the paired notch filters shift frequency. These changes in frequency probably carry the data content of the watermark, which can include such things as the record-label name and the catalog number of the disc.

I can't believe the SDMI gang had the balls to seriously consider Technology B. Doesn't anybody over there remember what happened to Copy Code? While narrow notch filters are in principle difficult to hear, once the filter frequencies are known it's a trivial problem to find "product" that has been sonically altered by the scheme's operation. I essentially did this manually when I was involved in the Copy Code tests, but a search of recordings can now be automated. And I'm ready to do it all over again if that is what it takes to kill this sonic monster once and for all.

S&V





# Operation Teletubby

**L**ast night I turned off the lights, drew down the shades, and embarked on a hunt for an energy hog. It's 2001, and California's energy crisis has turned the land of milk, honey, and digital entertainment into a place that makes the Ukraine look inviting. Dot-com workers huddle close to stay warm at unheated pink-slip parties, flannel is in, and blow-drying your hair with a car vent has become downright chic.

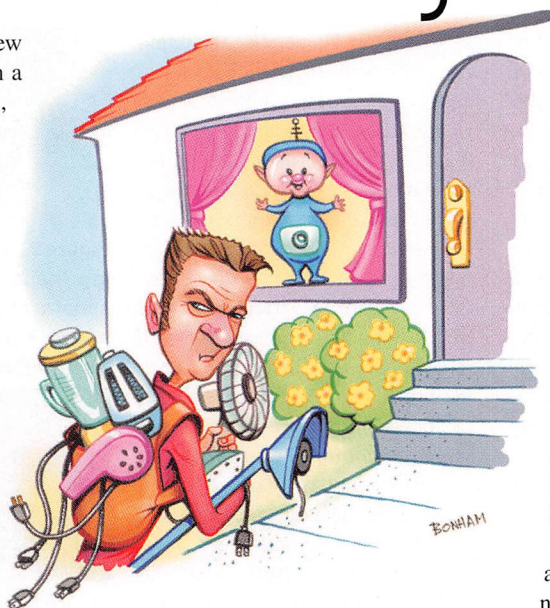
The energy crisis seemed like just another passing media event until our household's skyrocketing utility bills aroused my suspicions. Had somebody been tapping our power supply? How else to explain a bill that over the past year has more than quadrupled to nearly \$400 a month? Armed with my trusty Xanboo security camera, I planned to nail the 21st-century Goldilocks who was slipping into our house while we were away to watch TV, surf the

**Xanboo, a gadget-lover's dream, is a Web-based monitoring system that lets you see what's happening on the home front.**



Internet, take hot showers, and gobble up hot porridge. My stealth weapon, Xanboo, is a gadget-lover's dream — a monitoring system that allows you to log onto the Web from any location at any time and see what's happening on the home front. An all-in-one package of software and hardware, it links you to a password-protected control panel on the Xanboo Web site ([www.xanboo.com](http://www.xanboo.com)). From the retro 1960s-styled site, I can use a live feed to monitor activity picked up by a compact color-video camera placed anywhere in my house. For a \$14.95 monthly service fee or a \$120 annual subscription, Xanboo sends a notice to any e-mail address you specify whenever a camera or sensor registers an alert.

To discover who'd been sapping our power supply, I decided first to eliminate



the wilder possibilities, like a nervy neighbor tapping our basement outlet to run his weed whacker, or someone attempting to recharge the batteries in one of those cartoony little electric Corbin Sparrow cars.

Time for Operation Teletubby. Slitting open the back of my daughter's Teletubby doll, I cut a little round hole in its silver-lamé, television-shaped tummy, then slipped one of the eyeball-shaped Xanboo cameras with a built-in motion detector into it, ensuring that both the camera lens and motion sensor had a clear view. Next I linked the 6-foot cable attached to the camera/sensor to the 60-foot video cable that comes with Xanboo's remote-surveillance starter kit. (The \$150 kit also includes one of the motion-detector cameras, a system controller about the size of a portable CD player, and an installation CD with software for Windows-based computers.) Then I trained the Teletubby's belly on the steep driveway that leads to the basement garage of our San Francisco house.

After clicking through the straightforward instructions, I was rewarded about 20 minutes later with a 4 x 3-inch video window on the world of my driveway. I watched in awe as a leaf, a Styrofoam cup, and finally a newspaper blew past with the herky-jerky pace of an old-fashioned Zoe-

trope movie viewer. Talk about a video wasteland!

Realizing that this power theft could be an inside job, I also employed a few of Xanboo's wide variety of other sensors, each of which can be had for about \$20. To monitor comings and goings, I mounted one of the computer-mouse-shaped door sensors on the front door frame and its companion contact on the door. I also slipped a wireless water sensor — normally used to detect basement flooding — into our enormous Edwardian bathtub, just to make sure somebody wasn't surreptitiously indulging in long, hot baths.

Sure enough, at 2 p.m. the following afternoon, I received an e-mail at work notifying me that the camera's motion sensor had been triggered. I raced to type in the Xanboo URL to check out the intruder, and up popped an image of a figure with a crew cut and a saffron-colored shirt trudging up our front steps. Puzzled but not yet panicked, I decided to wait for the next alert.

At 5:30 p.m., the water sensor alerted me that someone was using the tub. At 6 p.m., I was hailed again. The Web site displayed an image of a poster-sized sign that read, "Need a ride?"

The jig was up. Spying the cables crisscrossing our dining-room floor, my husband had made the sign and aimed the Teletubby's belly straight at it, anticipating my daily call requesting a ride home from the local transit stop.

The mysterious crew-cut guest? A friend with a house key whose visit I'd forgotten about, just as I'd forgotten about the grandparents who'd stayed in our neighboring cottage last month — equipped with a water heater that rivals an SUV for energy consumption.

So much for the power-guzzler whodunit. Perhaps that high-tech Teletubby can help me figure out where my 2-year-old hides my glasses, or who owns that fancy PT Cruiser that's been blocking our driveway . . .

ILLUSTRATION BY STEVE BONHAM





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# Boxers or Briefs?

**Y**ou'll recall that during the '92 Presidential campaign, Arkansas governor Bill Clinton was asked by a female member of the MTV audience whether he wore boxers or briefs.

You may also recall that he dodged the question. The Chinese textile industry lobbied relentlessly for an answer, and subsequently, after accepting untold billions in Fruit of the Loom soft money, the GOP finally cornered Clinton in the basement of the White House and asked him point-blank what he was wearing under his her-ringbone. The President wittily rebuffed his adversaries by advising them that his answer depended on what the meaning of the word "wearing" is. All of which brings us to the question of sound quality.

**The difference in sound quality between DVD-Audio and DVD-Video is easy to see from the specs, but is it easy to hear?**



One of the great technological perks of the new DVD-Audio format is its capacity for multichannel music. Stereo was twice as good as mono, so 5.1-channel audio should be at least 2.55 times as good as stereo, right? Surround soundtracks are now de rigueur for movie theaters, and the music industry is slowly retooling to follow that lead. The industry's hope is that multichannel music will renew interest in serious listening — and, not coincidentally, make MP3 copies of stereo recordings seem far less desirable.

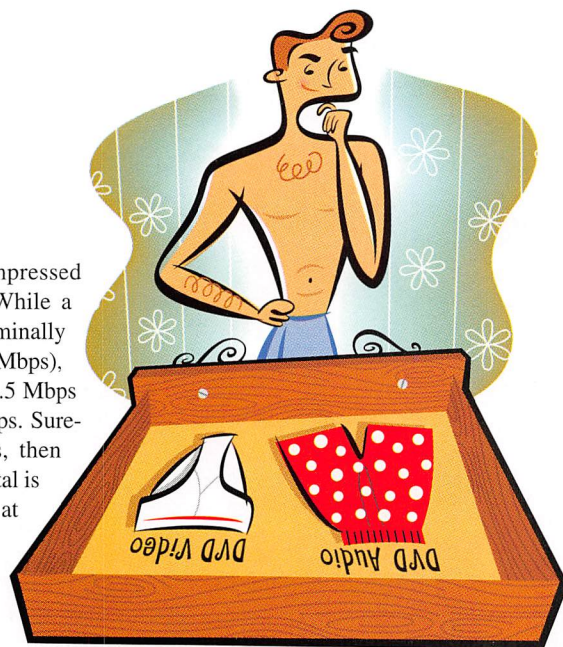
Of course, DVD-Video already offers surround sound not only for movies but for music as well, primarily concert videos. However, DVD-Audio holds a supreme advantage over DVD-Video: the sound quality is superior. It has to be, right? Just look at the numbers. DVD-Audio uses linear PCM coding to accommodate up to six channels of digital audio sampled at 96 kHz with word lengths up to 24 bits (along with a host of other encoding options). In comparison, most DVD-Video discs carry

their soundtracks as highly compressed Dolby Digital or DTS signals. While a DVD-Audio recording might nominally convey 9.6 megabits per second (Mbps), a DTS soundtrack might convey 1.5 Mbps and Dolby Digital only 0.384 Mbps. Surely, if DVD-Audio is like boxers, then DTS is like briefs, and Dolby Digital is merely a thong of data. (I recoil at the thought of Bill Clinton wearing a thong, and I sincerely apologize for fixing that mental picture in your mind.)

The difference in sound quality between DVD-Audio and DVD-Video is easy to see from the specs, but is it easy to hear? The answer becomes less obvious when we recall that DVD-Video discs don't have to carry only low-bit-rate audio. For example, although there aren't many such discs available, the DVD-Video standard can accommodate the following configurations of linear PCM soundtracks (sampling frequency/word length): 48 kHz/16 bits (eight channels), 48 kHz/20 bits (six channels), 48 kHz/24 bits (five channels), 96 kHz/16 bits (four channels), 96 kHz/20 bits (three channels) and 96 kHz/24 bits (two channels). These are hardly trivial audio specifications.

What's more, DTS and Dolby Digital can be tweaked for better performance. For example, DTS can code from one to eight channels at sampling frequencies up to 192 kHz with up to 24-bit word lengths. In fact, because DTS and Dolby Digital pack data more efficiently than linear PCM, it's easy for DVD-Video to simultaneously accommodate high sampling frequencies, long word lengths, and multiple channels. In short, a DVD-Video disc can hold awesome audio, particularly when most of its storage capacity is devoted to audio and isn't pre-empted by a video signal.

Still, by the numbers, DVD-Audio should hold the sonic edge over DVD-Video. Its multichannel PCM coding should be better than either DVD-Video's or DTS and Dolby Digital's coding. But is it? To help answer that question, you might listen, as I did, to a DVD-Audio title like



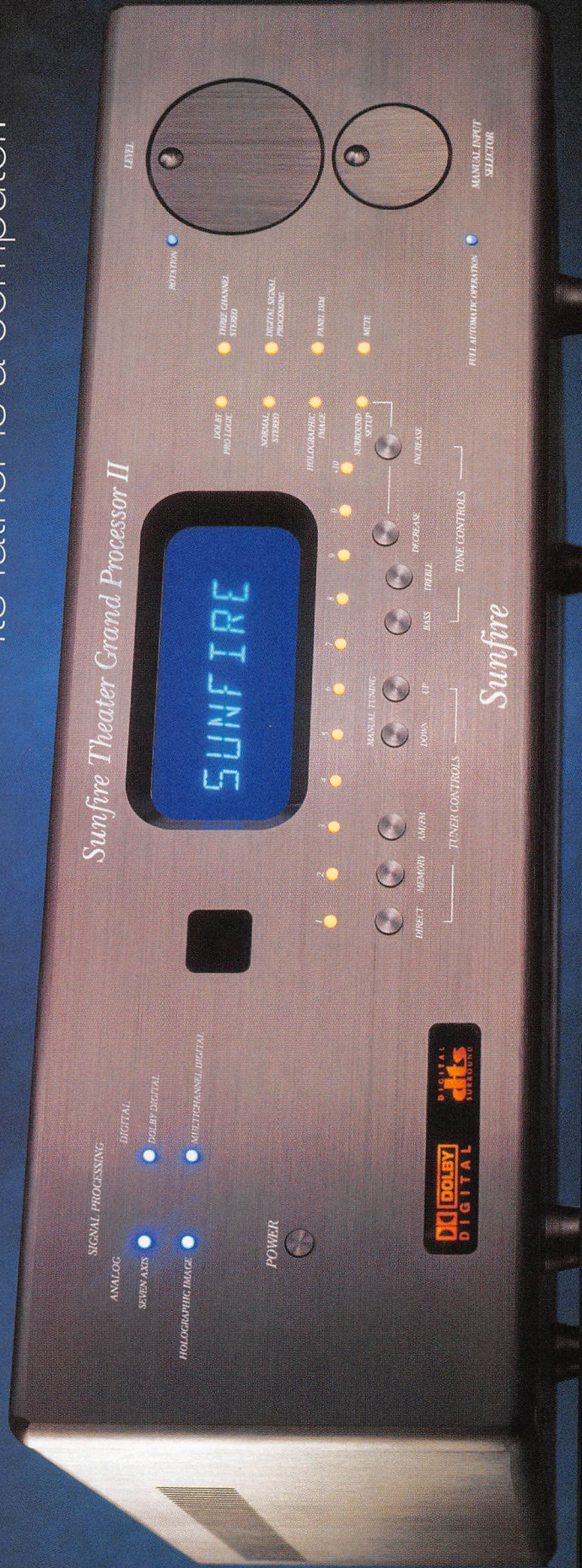
Aaron Neville's Devotion (Silverline). This disc carries the identical music mix in three different six-channel versions (or 5.1-channel, in the case of Dolby Digital and DTS): 96/24 linear PCM, DTS, and Dolby Digital. The essential question, of course, is which version sounds best.

By the numbers, we would expect PCM to sound better than DTS, which would sound better than Dolby Digital. In fact, if we trust the numbers, we might even conclude that DVD-Audio "blows away" DTS, which "blows away" Dolby Digital. And more than a few reviewers as well as mastering and recording engineers have said as much. But when I listen to these mixes, trying hard to ignore what the correct answer is supposed to be, I hear far more subtle variations than glaring differences, and the phrase "blows away" does not come to mind. I think I prefer DVD-Audio, but is that only because I am reassured by its specs, which imply that it captures sound better than I can hear it?

Surely, just as boxers cover more than briefs, which cover far more than thongs, higher bit rates must sound better. It would be awful, after all, to concede that Emperor DVD-Audio might not be wearing any clothing at all. So, understandably impatient, you press the question, which sounds better? With a note of exasperation, you ask me point-blank, does DVD-Audio sound better than DTS and Dolby Digital? My answer, of course, is that it all depends on what the meaning of the word "better" is. Don't tell me you're surprised.



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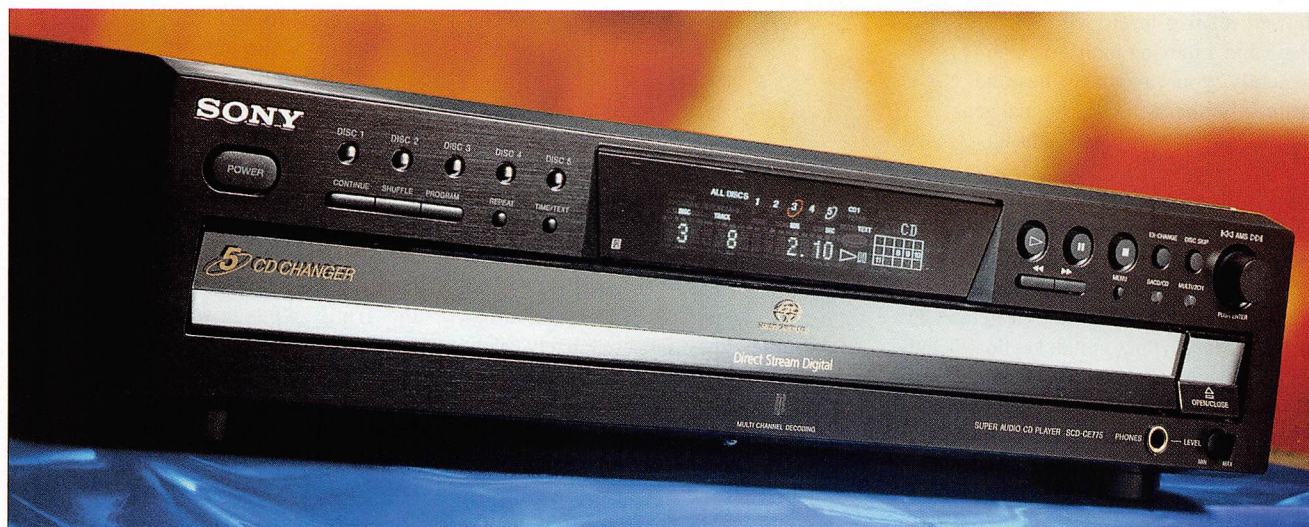
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# Sony

## SCD-CE775 SACD Changer



When I reviewed the first Super Audio CD (SACD) player, Sony's ultra-expensive SCD-1, in these pages almost two years ago, I envisioned the format as designed for audiophile "purists" who turned up their noses at CD and even (for reasons still very debatable) DVD playback. Since then, however, it's become clear that SACD is being positioned to compete directly against DVD-Audio. Whereas the first SACD players were two-channel only and carved from solid metal, the SCD-CE775 marries full surround sound playback with a plastic front panel and further flouts audiophile sensibilities by providing a five-disc carousel changer mechanism. But unlike the two-channel DVD-S9000ES SACD player I reviewed in January, it doesn't sweeten the deal by also playing DVD-Video discs. It plays SACDs and CDs, period.

The SCD-CE775's utilitarian front panel has enough controls that you might not even miss a lost remote. My favorite is the knob that lets you find a desired track with a quick twist. The Time/Text button lets you display CD/SACD text, if any (all the SACDs I've seen have disc and track titles, but it's still rare on regular CDs). The SACD/CD button lets you choose either the SACD or CD layer on hybrid discs,

while the MULT/2CH button lets you choose either the multichannel or two-channel mix on discs that offer both. Unfortunately, you can't use these buttons while a disc is playing, so you can forget about any instant A/B comparisons.

Unlike DVD players, the SCD-CE775 has no onscreen setup menu — or any video output. The menu button brings up text prompts for setup options on the fluorescent display. The remote control is a slender stick with a numeric keypad and buttons that largely duplicate the front panel.

Installation was an easy matter of connecting the six analog audio outputs to my receiver. Using the menu button, I set the default playback mode to SACD for multichannel and set up the player's onboard bass-management processing, a key feature that the first round of DVD-Audio players lack.

For the two-channel mode, I selected the 2CH+SW setting, which provides high-pass-filtered signals for the front left/right speakers and a mono low-pass-filtered signal for a subwoofer. The alternative 2CH Direct setting provides stereo signals only, with no subwoofer signal. These two-channel settings, however, operate only with two-channel SACDs, not CDs, which means that you might be better off using the digital output for CDs and having your receiver

do the CD decoding and bass redirection.

Next, for the multichannel mode, I selected 5-Large+SW so the player would provide full-range signals for my five main speakers and a low-pass-filtered bass signal for my subwoofer. Other choices will accommodate a number of different speaker configurations, including one (MCH Direct) for those rare systems with six full-range speakers. Like DVD-Audio, and unlike DVD-Video's Dolby Digital system, the SACD format doesn't require producers to reserve one of the potentially six channels for bass frequencies. ➤

### fast facts

#### KEY FEATURES

- Five-disc carousel changer for SACDs and CDs
- Includes bass-management processing for SACDs
- Plays CD-Rs and CD-RWs
- Can read and display CD/SACD text
- Headphone jack with level control

**OUTPUTS** (audio only) stereo analog and optical digital, multichannel analog

**DIMENSIONS** 16<sup>7</sup>/<sub>8</sub> inches wide, 4<sup>1</sup>/<sub>4</sub> inches high, 15<sup>1</sup>/<sub>4</sub> inches deep

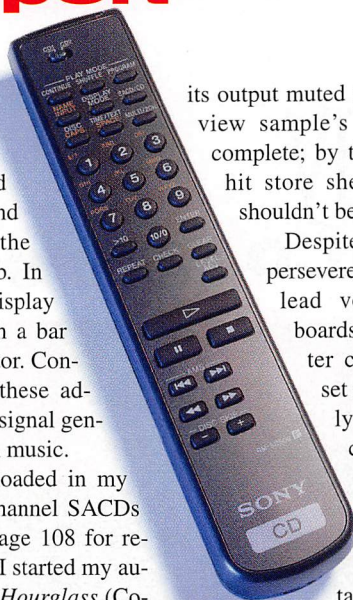
**WEIGHT** 13 pounds

**PRICE** \$399

**MANUFACTURER** Sony Consumer Electronics, Dept. S&V, 1 Sony Dr., Park Ridge, NJ 07656; [www.sel.sony.com](http://www.sel.sony.com); 800-222-7669



# test report



Using the remote's Level Adjust button, I optimized the relative output levels of the front L/R and center channels, the front and surround channels, and the front speakers and the sub. In each case, the fluorescent display showed relative levels with a bar graph and a moving indicator. Conveniently, you can make these adjustments either with a test signal generated by the player or with music.

Setup accomplished, I loaded in my entire collection of multichannel SACDs — all four of them (see page 108 for reviews of three of the four). I started my audition with James Taylor's *Hourglass* (Columbia), originally released as a stereo CD in 1997. The rhythm, guitar, keyboard, and vocal tracks were recorded in a cottage on Martha's Vineyard using a budget Yamaha 02R digital console and a Tascam DA-88 digital multitrack recorder. But don't let the humble origins fool you — *Hourglass* won recording engineer Frank Filipetti a Grammy for engineering and Taylor the Best Pop Album Grammy.

For the new multichannel SACD-only release, Filipetti prudently resisted adding any surround sound gimmicks that might detract from the simplicity of the music. In "Ananas," for instance, most of the sound remains in the front L/R channels as in the original mix. The center carries dry lead vocals (but not backup vocals) to help solidify the center image, and the surrounds are lightly used, with a little delayed and reverberated snare mixed in to add a sense of space. During the chorus, a few keyboard licks and some shouted lead-vocal phrases are added in back to liven things up. The kick drum and bass chugged along in my subwoofer. "Up from Your Life" has a similar mix but ends with a powerful bass line and low drum hits in all four "corners" as well as from the sub. To get the full effect, you'll need surround speakers with good bass response. In any case, the SCD-CE775 conveyed all the subtleties of these recordings with utter transparency.

For some more aggressive testing, I rotated the platter to the Guano Apes' *Don't Give Me Names* (a Supersonic/BMG import). This hybrid disc did not agree with our preproduction review sample of the player. With both the multichannel SACD mix and, to a lesser extent, the two-channel version of this disc, but not the CD layer,

its output muted again and again. (Our review sample's firmware wasn't quite complete; by the time production units hit store shelves this summer, this shouldn't be an issue.)

Despite the periodic muting, I persevered. On "No Speech," the lead vocals (and some keyboards) are isolated in the center channel, while the drum set and lead guitars are mainly placed in front and, of course, the bass guitar in the sub channel. The surround channels often erupt with backup vocals, powerful guitars, weird effects, and unidentifiable sounds. Yet at other times, they fall completely silent. The SCD-CE775 seemed oblivious to all



**The Sony player transparently conveyed all the surround sound subtleties of the new SACD of James Taylor's Grammy-winning *Hourglass*.**

this mayhem and simply delivered whatever was on the disc without complaint.

For a drastic change of pace, I listened to *Sacred Feast* (dmp), a compilation by the 31-member Gaudeamus choral ensemble conducted by Paul Halley. Recorded in the Trinity College Chapel in Hartford, Connecticut, they sound splendid on this multichannel hybrid SACD (truthfully, I'm

## in the lab

### MULTICHANNEL SACD PERFORMANCE

All measurements were made from the Philips SACD test disc. Results were typical for all channels. The MCH Direct setting was used for all tests except of the bass-management filters, which used the 5-small+SW setting.

**Maximum output level** .....2.22 volts

#### Frequency response

20 Hz to 20 kHz +0.01, -0.04 dB  
(-3 dB at 43.1 kHz)

**Noise level** (re -20-dBFS, digital-silence signal) .....-81.3 dB

#### Distortion (THD+N, 1 kHz)

at 0 dBFS .....0.0065%  
at -20 dBFS .....0.058%

#### Subwoofer-output frequency response

-12 dB/octave above -3-dB point of 121 Hz

#### High-pass-filter frequency response

-6 dB/octave below -3-dB point of 121 Hz

### STANDARD CD PERFORMANCE

All measurements were made using the **Sound & Vision** test CD-RW. All signals contained dither, which sets limits on measured distortion and noise performance.

**Maximum output level** .....2.2 volts

#### Frequency response

20 Hz to 20 kHz +0.02, -0.16 dB

**Noise level** (A-wtd) .....-74.3 dB

#### Excess noise (without/with sine tone)

16-bit (EN16) .....+1.3/+1.3 dB  
quasi-20-bit (EN20) .....+14.4/+14.4 dB

#### Distortion (THD+N, 1 kHz)

at 0 dBFS .....0.0043%  
at -20 dBFS .....0.024%

**Noise modulation** .....<0.5 dB

#### Linearity error (499 Hz)

at -90 dBFS .....-0.1 dB

#### Defect tracking

(Pierre Verany disc) .....1,500 µm

Like all the other SACD players we've tested, the SCD-CE775 had relatively high noise levels above 20 kHz generated by the Direct Stream Digital system, and these contaminated our measurements of the distortion and noise in the audio range. Its measured SACD noise level was only about 6 dB superior to CD playback (or the approximate equivalent of a 17-bit PCM system) and about 9 dB worse than the other multichannel SACD player I've tested. However, a spectrum analysis of the noise showed that below 20 kHz it was quite a bit lower than a CD player's and would be inaudible under all reasonable listening conditions. The CD playback also measured noisier than usual for both an SACD player and a similarly priced DVD player. I would have liked to see the EN16 figure closer to 0 dB and EN20 in single digits. But if you use the player's digital outputs when playing CDs, the noise performance will be set by the downstream equipment's digital-to-analog conversion circuits.

This is the first multichannel player of any variety to contain bass management, a considerable point in its favor. Unfortunately, the bass management turns on only when playing SACDs. So if you use the player's analog outputs and pop in a CD after setting up your system for SACDs, you may end up with a rolloff in the bass and nothing coming out of your subwoofer! Better to use the digital output for CDs so your receiver's bass-management will kick in. So near (to getting it right), and yet so far.

— David Ranada



## HIGH POINTS

Superlative SACD surround sound.

Good range of setup and  
bass-management options.

Reasonable price.

## LOW POINTS

Slow to switch between two-channel  
and multichannel mixes or  
between SACD and CD layers.

No video output.

Bass management works only  
with SACDs.

sure they'd sound splendid on a scratchy mono LP). The recording places the performers firmly in front, with generous amounts of natural reverberation in the surrounds. Interestingly, the six-channel master recording also captured sound from overhead, but with my setup this full-range track was sent to my subwoofer — like most people, I don't have a ceiling-mounted full-range speaker installed in my home theater. Even so, the reproduced sound quality was magnificent overall.

To complete my audition, I checked out a multichannel hybrid SACD sampler of movie and TV soundtrack medleys by Jerry Goldsmith, performed by the London Symphony conducted by the composer. The recording places you in the middle of the orchestra, with instruments and hall ambience coming from all around. The effect was interesting but not very convincing — it sounded as if the left/right stereo tracks were duplicated in the surround channels. This does give a sense of surround sound, but it's not realistic because you'd never hear an orchestra spread all around you (not even a conductor has that perspective). The sixth channel was not used for bass or anything else.

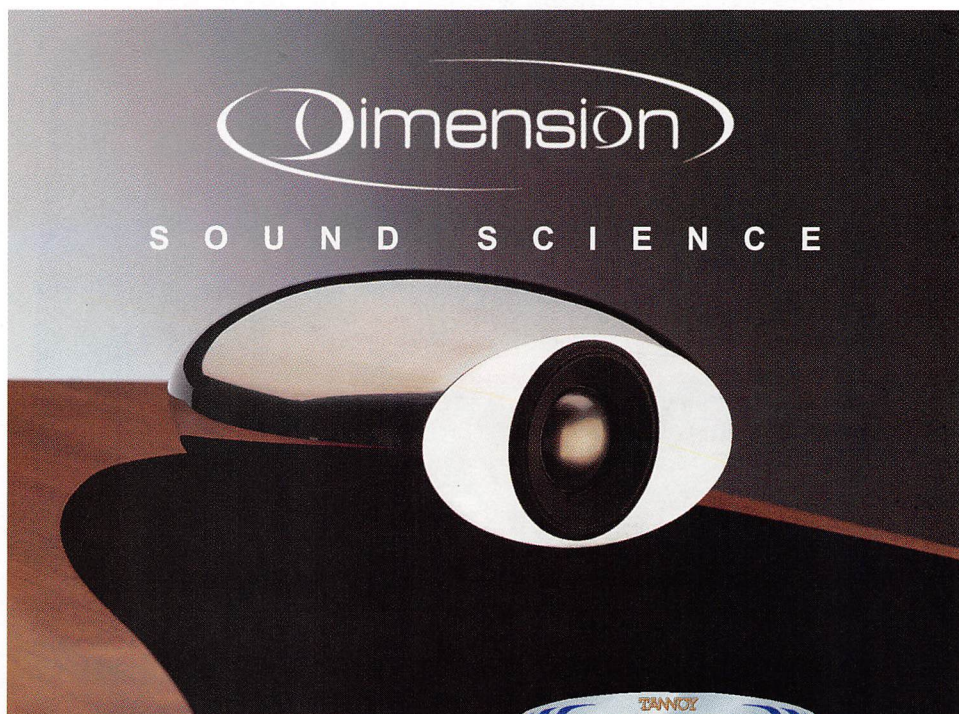
After all this surround sound auditioning, I switched back to stereo playback, which seemed stunningly flat and uninviting in comparison — like switching your TV from color to black-and-white. It left me wondering how I ever put up with plain stereo all those years!

A few operational notes: It took the SCD-CE775 about 10 seconds to switch between SACD disc layers or different mixes, and disc changes took about 15 seconds. I wish these times were a tad faster — I'm a busy guy. On the upside, the player provided fast track access and played

both write-once CD-R and rewritable CD-RW discs.

Sony's SCD-CE775 demonstrates just how fantastic SACD playback can be, especially with surround sound recordings. It's increasingly clear that the biggest challenge left for audio reproduction is not improving the playback electronics — the SCD-CE775 seemed completely transpar-

ent to me. If you believe that the SACD catalog will eventually contain the music you want to listen to and are more interested in listening to high-quality music than in watching video, then this five-disc changer presents an attractive invitation to the beauties of surround music. But if the format catches on, I'm holding out for an SACD megachanger. **S&W**



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# Princeton

## 36-inch HDTV Monitor with Ch.1 Service



**T**elevision makers must have short memories. Through the late 1990s, they tried to add Web-browsing and e-mail capabilities, but the TV-buying public greeted almost all of these hybrids with indifference. WebTV — low priced and so easy to set up your granny could do it — developed something of a following, but compared with the tens of millions who access the Internet with home computers, WebTV's user base is a mere drop in the bucket.

Now it's 2001, and TV manufacturers are ready to give the Web another shot. A new generation of Internet-enabled sets debuts this year, led by Princeton Graphic Systems' AI3.6HD HDTV monitor, a direct-view set with a standard 36-inch (diagonal) screen. (For a hands-on appraisal of the set's integrated Ch.1 Internet service,

see page 44.) As befits a TV with multimedia capabilities, the AI3.6HD can display VGA, SVGA, and XGA signals from any computer you connect to it. The dot pitch is 0.90 millimeter, which is large by computer-monitor standards, to make the picture bright enough for TV viewing, and the maximum rated resolution is 1,024 x 768 pixels. But computing is only half the story. The set has a built-in NTSC tuner for standard broadcast and cable signals, and it can also display high-definition signals from an outboard HDTV decoder like Princeton's own HDT-2000 (\$899).

The set's native digital display formats include standard-definition 480p (progressive) and high-definition 720p and 1080i (interlaced). Standard analog 480i-format signals from a DVD player, satellite receiver, or VCR are automatically line dou-

bled using technology licensed from Silicon Image (formerly DVDO) that incorporates 3:2 pulldown for film-based material. This feature eliminates the unsightly stairstep artifacts you often see on HDTV monitors when standard signals are upconverted.

Compared with other current direct-view sets, many of which sport slick, metallic-toned cabinets and flat screens, the Princeton is pretty plain looking, with a curved picture tube mounted in a matte black case. A small door below the screen conceals an A/V input with composite- and S-video jacks, a VGA port, and two USB connectors for a printer and other peripherals to be implemented in the future.

Unless you're familiar with professional-grade video gear, the Princeton's rear panel may seem forbidding, if only because most of the input jacks are pro-style BNC connectors (not to worry: you can

### fast facts

#### KEY FEATURES

- Can display 1080i- and 720p-format HDTV programs from an outboard tuner/decoder
- Integrated Ch.1 Internet service
- Built-in line doubler with 3:2 pulldown for standard-format programs
- Displays VGA, SVGA, and XGA computer signals
- 4:3 aspect ratio screen with two widescreen display modes, 1.66:1 and 1.77:1
- Universal remote with mini keyboard and mouse control

#### INPUTS/OUTPUTS

**front panel** A/V input with composite/S-video, stereo audio; VGA port; two USB ports  
**rear panel** four A/V inputs (composite/S-video, standard component video, wideband component video, and RGB+H/V), all with stereo audio; antenna input; stereo audio and composite-video outputs; RS-232C control connector; Ethernet port; two RJ-11 phone jacks; infrared repeater output

**DIMENSIONS** 34 $\frac{5}{8}$  inches wide, 31 inches high, 25 $\frac{1}{2}$  inches deep

**WEIGHT** 210 pounds

**PRICE** \$3,499

**MANUFACTURER** Princeton Graphic Systems, Dept. S&V, 2801 South Yale St., Santa Ana, CA 92704; [www.princetonhdtv.com](http://www.princetonhdtv.com); 800-747-6249



# "Like Strapping Yourself Onto a Rocket Sled and Lighting the Fuse"

— Darryl Wilkinson, *Home Theater Magazine*

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See our dealer list on page 66



## THE CH.1 INTERNET SERVICE

While I found several appealing features in Ch.1, the subscription-based Internet service built into the Princeton AI3.6HD, on the whole it should be called Ch.¾.

Web pages were readable from across the room on its flicker-free progressive-scan display, and a magnifier feature that

can keep an inset TV image onscreen while using Ch.1, you can't put a Web window into a TV picture.

The trapezoidal remote control, about the size of a human hand, which Princeton refers to as the RKM (remote/key-board/mouse), is awkward to use. Trying to precisely position the pointer over an onscreen button made my arm tired. The tiny keyboard under the flip cover allows two-finger typing at best (a full-size keyboard is a \$100 option). There are some dedicated Web buttons like Back and Go To on the RKM's inner panel, but you must first press the Web Apps button to make them active. An annoying LED keeps flashing until you press it again. Amazingly, while the Web Apps are active, you can't use the pointer. For a while the keyboard put the wrong

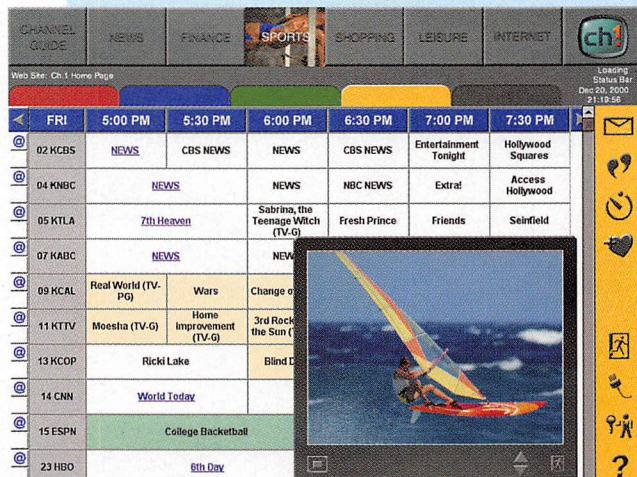
minutes. The TV set has an Ethernet port for a broadband connection so you can avoid dial-up.

Although the Princeton set works fine with multimedia input from a computer, the Ch.1 service is multimedia-challenged — don't expect this early version to play streaming audio or video. For example, when I tried to listen to a National Public Radio news update ([www.npr.org](http://www.npr.org)), I was greeted with "Unknown file type." It will, however, display a JPEG still image attached to e-mail. Ch.1 plans to update the software in the future to play streaming media.

Setup is a tedious process thanks to the dizzying array of subscription options. The family plan allows up to five users with four sets of custom accounts. There's an optional Internet filtering package that includes incoming and outgoing parental controls. An individual plan is \$19 per month, or \$20 with a filtering package. A family plan is \$22, or \$24 with a filtering package. If you have a broadband connection, prices are lower. You have to page down through 28 screens of legalese (I counted!) in the Ch.1 contract agreement, plus another 17 screens describing its privacy and security policies, then you have to type in your credit-card number and some personal information. It took me about an hour to complete the process — not counting inputting and testing setup codes for auxiliary devices.

The topper was that after I went through all this and downloaded Ch.1's four-day program guide, I discovered that every single show time was off by an hour. (*News at Noon* was listed at 11 a.m.) When I called technical support, I was told they'd failed to allow for Daylight Savings Time. It took them several weeks to fix the problem. At least in this version, Ch.1 isn't quite ready for prime time.

— Michael Antonoff



lets you enlarge a portion of the screen is useful for reading small print and maps. Ch.1 places shortcut buttons on its home page for news, shopping, sports, e-mail, and an interactive channel guide. The guide, which can be used offline once the information is downloaded, packs an astounding 3 hours of listings in each line thanks to its ad-free design and program descriptions that are displayed in a window only when you click on a title. You click on View to tune to that channel, and the TV picture appears in the nonmovable, nonresizable window.

You can use Ch.1 to set your VCR to record a show. (A dual-headed infrared emitter on a cable that plugs into the back of the set controls both your VCR and, if you're not using the set's own tuner for standard TV, a cable box.) Though you

characters onscreen. The troubleshooting guide in the manual suggested I press the reset button on the front of the TV, and that corrected the problem.

Ch.1 runs silent. There are no audible cues — one of WebTV's user-friendly hallmarks — and very little visual information about what's happening with the system. I was told more than once that I was successfully connected to the Ch.1 service when I was, in fact, offline. Performance was painfully slow. Using the 56-kbps modem built into the TV, Ch.1 took 2 minutes from the time I clicked the connect button to display the front page of *USA Today*. When I performed the same task using a four-year-old notebook computer with a 28-kbps modem running America Online (which I plugged into the Princeton's front VGA port), it also took 2

pick up BNC-to-RCA adapters at your local RadioShack). The HDTV inputs include both wideband component video and RGB+H/V. There's also a standard (480i) component input and a fourth A/V set with both composite- and S-video connections. A single input is provided for an indoor or outdoor antenna.

Unfortunately, you can't simply highlight an input onscreen and switch to it.

You have to cycle through the whole range of inputs, waiting a few seconds for each change to register, until you come to the one you want to use. One source-select key toggles through all the standard video inputs while another toggles through the wideband-component, RGB+H/V, and VGA ports.

Most of the buttons on the unusually shaped remote control pertain to the Ch.1

service — it even opens up to reveal a mini keyboard for Web/e-mail use! The operating keys on the outer shell aren't backlit, and I found the rubbery buttons too small and somewhat hard to locate and activate. It would have been nice if Princeton had also provided a second, stripped-down remote for basic TV viewing. Also, with a screen this large, you'd expect picture-in-picture (PIP) capability, but all you get is





picture-in-Web-page when you're using the Ch.1 interface.

In addition to standard picture controls such as color, contrast, and tint, the TV's setup menu provides three color-temperature settings: 9,300, 6,500, and 5,400 K. The first is said to be optimized for computer graphics, while the other two are designated for watching color and black-and-white video, respectively. The menu also lets you set the effective aspect ratio of the set's display at 1.33:1, 1.66:1, or 1.77:1. The first setting, essentially the same as 4:3, is for standard programs. The other settings vertically squeeze the set's raster so you can watch anamorphic DVDs of widescreen movies or widescreen HDTV programs without sacrificing resolution (but with black bars above and below the image).

Given that many different components can connect to the AI3.6HD — everything from a VCR to a videogame console to a laptop computer — Princeton wisely provided individual picture-setting memories for each of its inputs. It also has separate color-matrix settings for standard and HDTV signals, which keeps the set's color rendition accurate as you switch between standard- and high-definition sources.

After getting acquainted with the set's many features, I hooked it up to our reference system and went through my usual setup regimen. I selected the 6,500-K color-temperature setting and 1.77:1 display mode and made initial picture adjustments using Ovation Software's *Avia* test DVD. Then I popped *What Lies Beneath* into my DVD player. At first, the movie image looked somewhat squished vertically, and

there was some geometric (pincushion) distortion that made letterboxed images bend inward at the edges of the screen. Since the set's 1.66:1 display mode delivered more accurate geometry with widescreen images, I selected that instead and corrected the remaining edge distortion using a special service remote Princeton makes available to dealers only. (When the set's high-def inputs are used, the standard setup menu offers full geometry controls.)

Back to watching DVD movies, I found that the Princeton delivered an impressive amount of picture detail. Not only were the images crisp, but the set's line doubler did an excellent job handling difficult material — like a slow crane shot over a fortress surrounded by craggy cliffs in Chapter 8 of *Dragonheart*. Colors generally looked robust and clean, but in a scene from *What Lies Beneath* where Harrison Ford and Michelle Pfeiffer sit in bed talking, both actors appeared so painfully sunburned I wanted to hand them a bottle of Nivea. When I watched this scene again after calibrating the set's grayscale (see "in the lab"), their skin was still reddish, but the hue was more natural.

The Princeton set also did a consistent job of bringing out shadow details in both gloomy and brightly lit scenes. A slight pinkish tint extended over portions of the screen, however — it wasn't all that visible on color programs but hard to overlook on a black-and-white movie received from DirecTV. Fortunately, the problem was not in evidence on a second review sample.

HDTV fans will appreciate the Princeton's ability to display both the 720p and 1080i formats in their native resolution. However, the present dearth of 720p broadcasting renders this capability more of a curiosity than a truly useful feature. (Only the ABC network is delivering its scant schedule of high-def programming in this format.) Playing a 1080i-format loop of high-def Discovery Channel clips on DirecTV, the set provided an image detailed enough to deliver what I call "HDTV presence" — a you-are-there quality that prac-

## HIGH POINTS

Excellent detail in high-def display.  
Excellent line-doubler performance.  
Wide variety of input options.

## LOW POINTS

Costs more than similar-size HDTV monitors.  
Remote control is hard to use for TV/DVD viewing.  
Minor screen-geometry and uniformity problems.

tically glues you to the screen. Watching the clip of a crocodile hunter seizing the head of his reptilian prey, I was startled to note some similarities in skin texture between the grizzled sportsman and the captured croc.

At \$3,499 list, Princeton's AI3.6HD doesn't come cheap. A number of less expensive "HDTV-ready" 36-inch sets are available. But none of them provides access to the Ch.1 Internet platform, has both 1080i and 720p native resolution, or has a line doubler that's likely to match the performance of the one inside the AI3.6HD. If you're looking for both a highly capable HDTV monitor and a way to surf the Web from your couch, this could be a good way to go.

S&V

## in the lab

**COLOR TEMPERATURE** (6,500-K setting, before/after calibration)

Low window .....7,269/6,422 K  
High window .....7,844/6,670 K

**BRIGHTNESS** (6,500-K setting, before/after calibration) .....18.7/16.2 fL

Although the Princeton AI3.6HD's 6,500-K color-temperature setting was fairly accurate out of the box, calibration helped bring its grayscale closer to the NTSC standard. This procedure must be performed by a qualified technician with specialized equipment. Discuss it with your dealer before purchase, or contact the Imaging Science Foundation (561-997-9073, [www.imaging-science.com](http://www.imaging-science.com)). After calibration, grayscale tracking was within 200 K of the standard. The 5,400-K preset intended for viewing black-and-white movies delivered a slightly warmer overall look, but it measured too close to the 6,500-K preset to make much difference. The set's NTSC color decoder was very accurate. Image geometry was average, with mild horizontal stretching in the set's 1.33:1 mode and mild bowing distortion visible at the screen edges in the 1.66:1 and 1.77:1 modes. — A.G.





# Paradigm

## System 8 Home Theater Speaker System



**L**ife is short. Why shouldn't you treat yourself to a porterhouse and a bottle of merlot now and then? And why not enjoy decent speakers, too? In a world of surround sound speaker systems priced around \$1,000, it's easy to forget that there's a parallel universe populated by people who spend a little more money and get a lot better sound. When the Paradigm System 8 arrived on my doorstep, its weight alone (249 pounds total) told me that I was about to smash the \$1k barrier and enter that other world.

The System 8 comprises a pair of Monitor 11 tower-style speakers for the front left/right channels, a CC-370 for the center, a pair of ADP-370 surrounds, and a PW-2200 subwoofer. The speakers are relatively plain looking, with standard-issue black cloth grilles and woodgrain-vinyl-clad particleboard cabinets. Don't get me

wrong — they're not ugly by any stretch, just plain. And that can be a *good* thing, assuming that the expense saved by foregoing doodads like titanium speaker spikes and lustrous real-wood veneers was put into something that might affect performance. I'm not the kind of guy who wants to drink a \$70 merlot if the bottle it comes in costs \$50 to make.

The slim Monitor 11 is not only a three-way design but has — count 'em! — three woofers. The center speaker's trapezoidal cabinet helps to aim it at the listening position from atop a TV. The ADP-370 surround is a dipole radiator — the grille cloth on its "front" is a dummy. Two of the top edges of the PW-2200 subwoofer are attractively beveled. Its front-firing 12-inch plastic cone is vented on the rear by what is perhaps the largest-diameter port I have ever seen (5 inches across).

Installation posed no technical challenges, just muscular ones. I first dropped the cabinets into approximately correct positions, placing the center speaker on top of my TV and the surrounds on speaker stands; when I was done, all the tweeters were at or near my seated ear level. Then I wired everything up, connecting my receiver's amplifier outputs to the five main speakers and its line-level LFE (low-frequency effects) output to the sub. I set the receiver's bass management for a "large" front L/R pair and "small" speakers elsewhere.

Wiring completed, I powered up and started tweaking. The first thing I noticed was that the Monitor 11 casts a pretty fierce flux field (it's not magnetically shielded, though shielding is available as a \$40 option). To avoid visual distortion on my direct-view TV, I had to move each tower about 6 feet away from the screen. The resulting 15-foot spread was a little wide for my room's layout, but acceptable.

I spent some quality time adjusting the subwoofer's position, level, phase, and cutoff frequency. By now I have a pretty good idea of the optimal sub location in my listening room (along the front wall, between the screen and left front speaker), but I moved the Paradigm sub a wee bit to improve the bass at the listening position. In the end, a cutoff frequency of about 70 Hz gave me the best possible blend between the sub and the main speakers. That's lower than usual for my room, but understandable considering that the Monitor 11 is a fairly large tower speaker that can play pretty low.

I started my critical listening with just the Monitor 11s and the Georg Solti/Chicago Symphony Orchestra recording of the Beethoven Ninth Symphony (London). I know this great recording well — it was made at the University of Illinois campus in May 1972 when I was a student there, and I snuck in for the sessions. If I heard anything bad, I would mercilessly nail the speakers, but the Monitor 11s sounded excellent, highly transparent and with tight, stable imaging.

Based on experience, I expected the tita-



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# test report

nium tweeters to be too bright, but I was delighted by their sound, which was very crisp but not harsh. They provided a terrific natural presence and avoided the "blat" of cheap tweeters. The bass response was also quite good — tight and punchy, with enough low-end extension for most classical music (everything except pipe organ).

To audition the full ensemble, I turned to the multichannel DVD-Audio version of *Buena Vista Social Club* (World Circuit/Nonesuch, reviewed in the April **Sound & Vision**). This lively recording features some of the greatest Cuban musicians ever, playing tunes that get your body moving. More important, the disc is a textbook example of how to make a surround mix work. The Paradigm system did a superb job reproducing the music because it follows the cardinal rule of multichannel playback: timbre-matched speakers all around, so no matter where instruments are placed in the mix, they sound connected acoustically to instruments in the other channels. Without that, you're a dead duck.

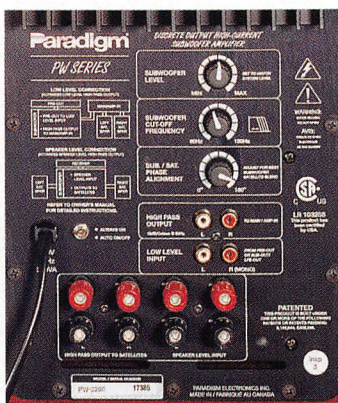
I was especially happy with the interplay between the Monitor 11's low end and

the PW-2200's upper end. Many of these songs have harmonically complex string-bass lines reinforced by percussion, and a lame "one-note" woofer would have murdered them. The PW-2200 proved to be musical, handling the low end with clarity and cleanly handing off the upper frequencies to the Monitor 11s. Sometimes you can get away with tiny satellites and a big subwoofer, but this Paradigm ensemble makes a good argument that it's better to have decent bass response in your main speakers, too, or at least the front left/right pair.

I was a bit less enthusiastic about the ADP-370 surrounds. They are fantastic speakers, but they're dipoles — terrific for creating ambience, not as good at surround imaging. That's no problem with movies, and sometimes not even with multichannel music (particularly classical music), but some of the *Buena Vista* tunes would have benefited from more precise surround imaging. For example, in some songs the backup vocals



**Lost Souls**, a moody morality movie starring Wynona Ryder, raised enough hell to give the Paradigm System 8 speakers a good workout.



are placed in all four "corners" of the soundstage. They sounded fine, but the imaging in the front and back was completely different, which I doubt is what the mixing engineer intended. I'd have preferred direct-firing surrounds in this case. Of course, Paradigm offers a variety of nondipole speakers to choose from. For example, a pair of Monitor 5s in back would completely erase my complaint.

To test the system's cinema prowess, I turned to *Lost Souls*, a moody morality play starring Winona Ryder. This installment of devil-baiting isn't nearly as much fun as a romp with the Antichrist could be, but it's still entertaining. Helping things considerably is the 5.1-channel Dolby Digital soundtrack (the DVD also has a DTS version), which surrounds you in nearly nonstop sonic tension.

In Chapter 3, Ryder and company perform an exorcism on mental patient John Diehl, who clearly needs one. The scene contains a flashback to Ryder's own exorcism. Quite literally, all hell breaks loose, with ungodly shrieks, demonic voices, and thoroughly modern music crashing in from all around. Fire sprinklers let go, and the water is as drenching as the sonic assault.

Chapter 4 changes gears, switching to a courtroom scene, and the soundtrack calms down several notches. Dialogue is placed solely in the center channel, smothered by reverberation that is also delayed and directed to the surrounds. Meanwhile, the front L/R channels carry a clutter of ambient room sounds like papers shuffling and people coughing. Both of these soundscapes were convincingly conveyed by the Paradigm speakers. The initial assault was appropriately immersive, even room-shaking when the sub kicked in. The courtroom dialogue was clearly intelligible despite the reverberation, and the surrounds supplied realistic room ambience.

I've visited some distressing restrooms, but none can compare with Ryder's experience in the john in Chapter 7. Water swirl-

## fast facts

	MONITOR 11 (L/R front)	CC-370 (center)	ADP-370 (surround)	PW-2200 (subwoofer)
<b>TWEETER</b>	1-inch dome	1-inch dome	two 1-inch domes	—
<b>MIDRANGE</b>	6½-inch cone	—	—	—
<b>WOOFER</b>	three 6½-inch cones	two 6½-inch cones	two 6½-inch cones	12-inch cone
<b>ENCLOSURE</b>	vented	vented	sealed	vented
<b>POWER</b>	—	—	—	250 watts
<b>INPUTS/OUTPUTS</b>	biwireable gold-plated binding posts	gold-plated binding posts	gold-plated binding posts	RCA line-level input, high-pass output; binding-post speaker-level input, high-pass output
<b>DIMENSIONS (WxHxD)</b>	7½ x 43½ x 14½ inches	2¾ x 7½ x 10¼ inches	11¾ x 13 x 8¾ inches	16½ x 19¾ x 21½ inches
<b>WEIGHT</b>	54 pounds	25 pounds	26 pounds	69 pounds
<b>FINISH</b>	light cherry, rosenut, or black ash vinyl	black vinyl	black or white vinyl	light cherry, rosenut, or black ash vinyl
<b>PRICE</b>	\$999 a pair	\$329	\$699 a pair	\$799
<b>Total: \$2,826</b>				

**MANUFACTURER** Paradigm, Division of AudioStream, Dept. S&V, MPO Box 2410, Niagara Falls, NY 14302; [www.paradigm.com](http://www.paradigm.com); 905-632-0180



ing down a drain is depicted as a maelstrom of watery horror, and sounds swirl all around as God knows what shoots from the toilets and flows across the tiled floor. Property values plummet as plaster walls crack and the lights go dark, then Diehl reappears and presses a knife point toward Ryder's eye. Dark, horrible sound effects and orchestral climaxes erupt from all channels. The System 8 handled all this quite nicely, even when I tempted intervention from the church across the street by cranking up my volume to nearly full blast. It achieved the goal of every playback system: after a while, I forgot about listening to the speakers and was simply drawn into the action.

I liked Paradigm's System 8. Its complement of 22 drivers will fill any listening room or home theater with loads of excellent sound. It's certainly up to any evening at the movies, with its dipole surrounds particularly adept at enveloping you in the action, and it won't disappoint you for more

**HIGH POINTS**

Excellent sound quality.  
Great bass and more from front L/R pair.  
Dipole surrounds are fantastic for movies.  
Terrific bang for the buck.

**LOW POINTS**

Ordinary styling.  
Front L/R pair needs extra-cost magnetic shielding.  
Dipole surrounds give vague imaging for multichannel music.  
Not cheap.

critical music listening. The Monitor 11 is a serious speaker in its own right, used alone as a stereo pair. This is not the cheapest speaker system in the world, but it does deliver exceptional sonic value. You might wonder if you should spend this much for speakers. The answer is easy: if you like them and can afford it, sure! Life is too short for bad speakers. **S&V**

## in the lab

**FREQUENCY RESPONSE** (at 2 meters)  
front left/right ..... 61 Hz to 20 kHz  $\pm 4.0$  dB  
center ..... 74 Hz to 20 kHz  $\pm 4.8$  dB  
surround ..... 74 Hz to 10 kHz  $\pm 3.6$  dB  
subwoofer ..... 28 Hz to 117 Hz  $\pm 2.4$  dB

**SENSITIVITY** (SPL at 1 meter with 2.8 volts of pink-noise input)  
front left/right ..... 94 dB  
center ..... 90 dB  
surround ..... 85 dB

**IMPEDANCE** (minimum/nominal)  
front left/right ..... 3.4/8 ohms  
center ..... 6.4/8 ohms  
surround ..... 5.1/8 ohms

**BASS LIMITS** (lowest frequency and maximum SPL with limit of 10% distortion at 2 meters in a large room)  
front left/right ..... 25 Hz at 84 dB SPL  
center ..... 40 Hz at 80 dB SPL  
surround ..... 40 Hz at 78 dB SPL  
subwoofer ..... 20 Hz at 84 dB SPL  
108 dB average SPL from 25 to 62 Hz  
109.6 dB maximum SPL at 62 Hz

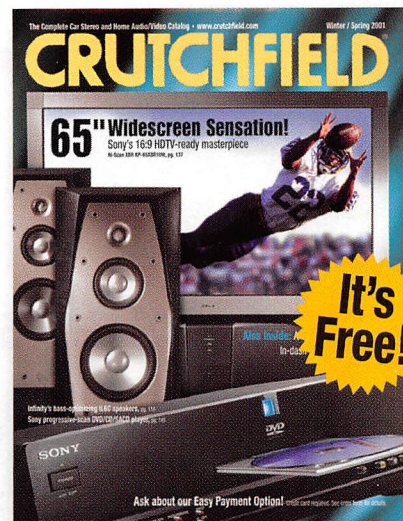
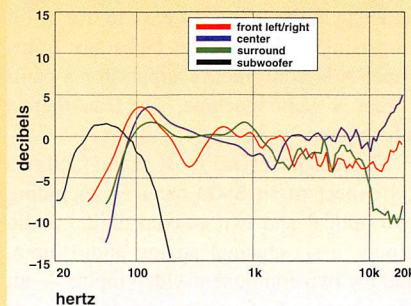
Measurements are weighted to reflect how sound arrives at a listener's ears with normal speaker placement. The Monitor 11 had a downward-tilted overall spectral balance, with a 3-dB elevation at 100 Hz followed by the 300-Hz floor-bounce notch common to tower-style speakers and culminating with a noticeable tweeter peak just below 20 kHz. Off-axis response was remarkably uniform, and it had unusually good low-frequency output.

The CC-370's curve has the same basic shape as the Monitor 11's. It had excellent

response directly on-axis, but by 22.5° off-axis a large notch developed between 1 and 2 kHz. Low-frequency output was quite good. The ADP-370 also had very good low-frequency output, especially for a surround speaker. The speaker comes in mirror-image left/right pairs with different crossover settings for their respective forward- and rearward-radiating sides. In my measurements, either speaker had 3 dB greater high-frequency output on its forward-radiating side than in the rearward direction (+3 dB between 2 and 10 kHz and approximately 6 dB more above 10 kHz).

Bass limits for the PW-2200 subwoofer were measured with it in the optimal corner of a 7,500-cubic foot room. In a smaller room users can expect 2 to 3 Hz deeper extension and up to 3 dB higher sound-pressure level (SPL). The PW-2200 had Herculean deep-bass output, with an outstandingly extended, smooth, and flat power response, producing 109 dB SPL  $\pm 0.5$  dB between 32 and 62 Hz.

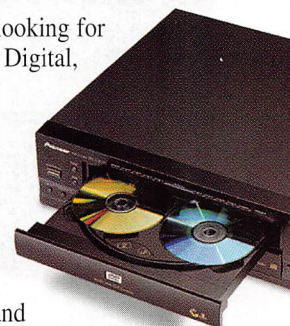
— Tom Noursaine



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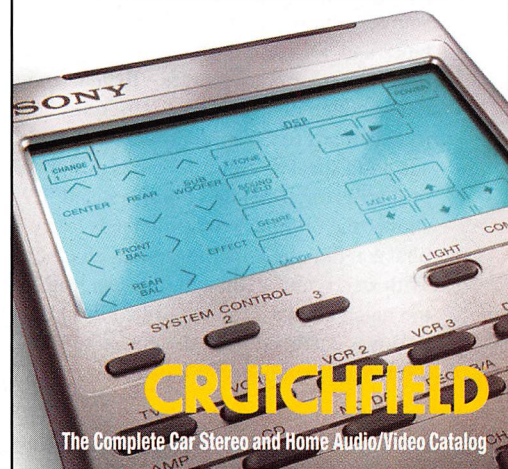
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# Onkyo

## TX-DS696 Digital Surround Receiver



Almost 20 years ago matrix-encoded Dolby Surround videotapes and laserdiscs brought surround sound to home theaters. Almost 15 years ago Dolby Pro Logic decoding raised the ante by extracting a center-channel signal from Dolby Surround recordings. And more than half a decade has passed since Dolby Digital brought discrete digital 5.1-channel surround sound home. So the arrival of Dolby Pro Logic II seems right about on schedule, and Onkyo's TX-DS696 is one of the first receivers to offer it.

Pro Logic II (or PL II, as I'll call it) aims to deliver a 5.1-channel-like listening experience from Dolby Surround-encoded sources (the format is still used for videotapes and TV surround) and even ordinary two-channel stereo sources. To that end, the decoder chip can steer discrete surround effects to the appropriate left or right surround speaker. Because it was designed primarily for listening to movies and TV shows, the original Pro Logic tends to emphasize dialogue in the center channel. With stereo music, though, this can lead to too much emphasis on the center. Pro Logic II was designed from the outset to bring a surround experience to music.

The TX-DS696 also has a full suite of other goodies, including *two* wideband component-video inputs, which will let you connect both a progressive-scan DVD player and a digital TV tuner. Even more unusual is built-in composite-to-S-video signal conversion for all of the video inputs and outputs, which can simplify your system hookup substantially. Equally valuable is the inclusion of THX Cinema Re-Equalization (Re-EQ), which gently rolls off the treble in the front channels to compensate for the bright, sometimes harsh quality of many movie soundtracks.

The front panel has only a handful of buttons and knobs, including a Smart Scan Navigator that's a multifunction knob for setup, mode selection, and more. Once you understand the logic, it's easy to use. A bit surprisingly, the receiver lacks any front-panel A/V convenience inputs for a camcorder or game machine — at least there's a headphone jack.

The rear panel has most of the facilities I'd expect in an \$800 receiver, including two optical and two coaxial digital audio inputs, a six-channel analog audio input, and the two component-video inputs — all of which can be freely assigned to any relevant source. But there's no digital audio

output, which might complicate things if you have a CD recorder. Note also that, like virtually all other digital surround receivers, the TX-DS696 provides no bass management for its multichannel analog input.

I connected the receiver to a high-performance six-speaker suite, including dipole surrounds and a powerful subwoofer. The onscreen menus made the usual setup routines self-explanatory, and with one exception I was able to complete them quickly with the help of the supplied programmed/learning remote, which I liked a good deal. It seemed busy at first glance but turned out to be very easy to use thanks to the wide variety of shapes and sizes for the buttons and the sensible spacing be-

### fast facts

**RATED POWER** 100 W x 5 into 8 ohms from 20 Hz to 20 kHz with less than 0.08% total harmonic distortion (THD)

**DIMENSIONS** 17½ inches wide, 6⅞ inches high, 17 inches deep

**WEIGHT** 27¾ pounds

**PRICE** \$830

**MANUFACTURER** Onkyo USA, Dept. S&V, 18 Park Way, Upper Saddle River, NJ 07446; [www.onkyousa.com](http://www.onkyousa.com); 800-229-1687





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## key features

- Dolby Digital, DTS, and digital Dolby Pro Logic II surround decoding
- THX Cinema Re-EQ
- 96-kHz/24-bit DACs for all channels
- 2 optical and 2 coaxial freely assignable digital audio inputs
- 5 A/V inputs and 2 A/V outputs, all with S-video
- 2 freely assignable component-video inputs, 1 component-video output
- 6-channel analog audio input
- 3 analog audio-only stereo inputs, one output
- Preamp outputs for all channels
- Binding posts for all speaker outputs
- Multiroom stereo audio outputs and IR facilities; Zone 2 speaker outputs
- Programmed/learning remote with key backlighting

tween them. Onkyo has wisely included a Light key that illuminates all of the buttons so the keytop labels are perfectly legible. Unfortunately, the lettering on the remote's panel is still tough to read in the dark.

You use one group of buttons to select the receiver input and a second, totally separate group to select which component the remote will control (it can operate eight different devices). That sounds cumbersome, but it's probably the least confusing solution to this universally vexing design problem for system remote controls.

The setup exception I mentioned concerned channel balancing. Initially I balanced the channel levels using the receiver's noise generator and my usual sound-level meter, but the result seemed terribly bass-shy with soundtracks and music. When I reset the channel levels using Ovation Software's *Avia* home theater setup DVD, I found that the subwoofer level dictated by the TX-DS696's noise generator was almost 10 dB too low. To be fair, if you set up by ear using music and soundtracks, instead of with the noise signals and a sound-level meter, you likely won't have this problem. But those who rely on science (as we so often urge) and use Onkyo's noise generator and a meter to set levels may end up bass-deprived.

Once everything was balanced and running, I had no complaints about the TX-DS696's stereo operation. The receiver had ample power to drive my very low-sensitivity left/right front speak-

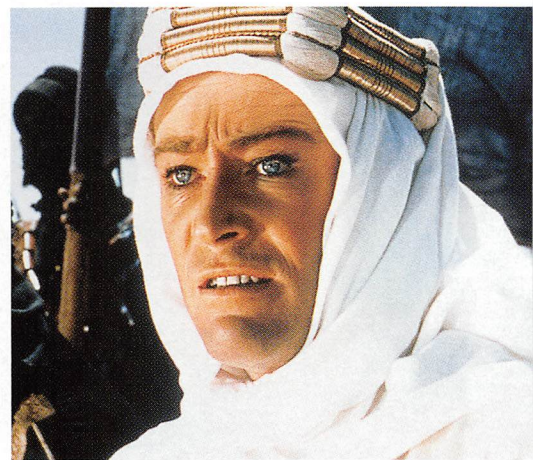
ers, even running full-range, to satisfying levels without audible strain.

In a hurry to try out Dolby's shiny new Pro Logic II, I cut short the stereo listening session and cued up Emmy Lou Harris's *Spyboy* (Eminent), one of the better-sounding live CDs that I've discovered in recent months. Selecting PL II Music with the remote, I played the lovely "Prayer in D." It sounded lush, spacious, and believable. Ambience was dramatically enhanced, with a three-dimensional sense of depth. Harris's ever-bruised alto took on an almost holographic quality. Her voice lost a bit of its low-end heft, but from bass to treble, the rest of the music behaved itself, which is more than can be said for many ambience-enhancement surround modes — or standard Pro Logic, for that matter.

It was interesting to compare the PL II Music mode with the PL II Movie mode (easily done by toggling between them on the remote). The Music mode was clearly superior for music (duh!) — sounding wider, more spacious and relaxed, and, well, more musical.

For a trial of PL II's Movie mode with matrixed Dolby Surround material, I chose the *Dances with Wolves* laserdisc, which I was able to cue up in sync with the Dolby Digital 5.1-channel DVD of the same movie. I switched between them by alternating between the receiver's DVD and Video-1 inputs — for each input, it remembers the surround mode you last selected. As you might expect, this was also an interesting comparison. (My initial reaction, however, was amazement that I once actually thought laserdiscs looked great. Boy, a direct comparison with the same movie on DVD disabused me of that notion in a hurry!)

Surprisingly, as decoded by PL II the Dolby Surround soundtrack often sounded more spacious and "sweepy" than the Dolby Digital soundtrack. Directional surround cues were clearly present, as in the



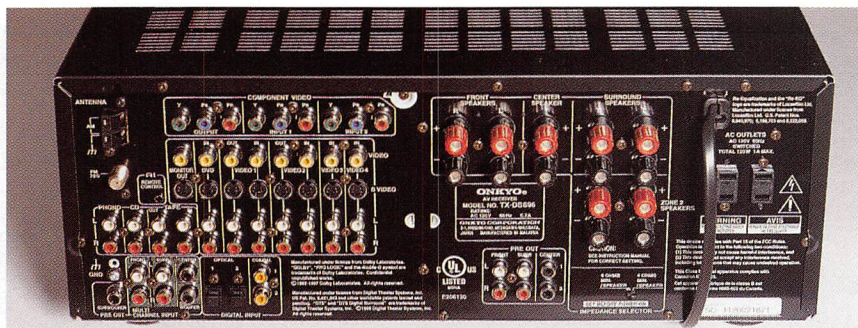
**Great performances: Peter O'Toole in *Lawrence of Arabia* and the Onkyo TX-DX696's Dolby Digital decoding.**

lateral swooshing sounds of combat during the prairie massacre of the Indian family, something standard Pro Logic could not have accomplished. But those directional cues weren't always perfect.

In the scene where Kevin Costner approaches the Indian village for the first time, I distinctly heard the French horns in the left surround channel — as well as where they belonged, across the front — as the music faded up. The PL II playback also sounded slightly brighter, and a bit harsher, though I don't know how much these effects are attributable to differences in the laserdisc and DVD mixes.

As I expected from past experience with Onkyo receivers, the TX-DS696's Dolby Digital performance was first-rate. The receiver delivered ample spatial sweep and precision for both Costner's western epic and the DVD of *Lawrence of Arabia*. Indeed, it plainly revealed the flaws — by current standards — in the soundtrack of David Lean's 40-year-old film classic, even as remastered for Dolby Digital 5.1.

For example, in the desert air-raid scene early in the picture, the pinpoint sonic localization and sense of movement for the biplanes was curiously at odds with the decidedly low-fi, bass-shy explosions. (But it





was right in step with the unexpectedly stagey, makeup-intensive look of the film. So *that's* where Obi-Wan Kenobi came from!) I was disappointed by the DVD's somewhat brittle, hard sound in the London Symphony's performance of Maurice Jarre's ultra-swoopy score. Fortunately, the receiver's Cinema Re-EQ option made the music a good deal more listenable.

The TX-DS696 has four "extra" surround modes: Orchestra, Unplugged, Studio Mix, and TV Logic. Most rely on more delay or reverb processing than I generally like, but they do permit you to independently adjust front- and surround-channel effect levels (low, mid, or high).

The receiver gives you only one set of relative channel memories — that is, only the calibrated speaker levels can be stored, and they apply to all sources and surround modes. You can, however, modify any channel's settings on the fly using the channel-select and level keys on the remote or front panel. The receiver reverts to the stored values after being turned off.

Radio performance was only average, with generally fine sound from strong or local FM signals but mediocre to poor results with weak, fringe stations. AM reception was no better. This is entirely typical

## HIGH POINTS

Pro Logic II decoding with separate modes for movies and music.  
Two wideband component-video inputs with switching.  
Well-designed remote control.

## LOW POINTS

No front-panel convenience jacks.  
No digital audio output.  
Internal test-noise generator yields wrong subwoofer level setting.

of today's receivers but was disappointing nonetheless.

The Onkyo TX-DS696 is the first receiver I've encountered with Pro Logic II, and that substantial perk comes in a sensibly equipped package that's priced fairly. Most important, the receiver's performance in its basic Dolby Digital and stereo modes is excellent. The TX-DS696 lacks a couple of nice but nonessential features that can be found in some less expensive receivers (front-panel A/V inputs, a digital audio output), but it includes others, such as speaker-level outputs for a second zone. It's a fair trade as far as I'm concerned. **S&W**

## in the lab

### DOLBY DIGITAL PERFORMANCE

All data were obtained from the Dolby Labs test DVD using dithered test signals, which set limits on measured distortion and noise performance. Reference input level is -20 dBFS, and reference output is 1 watt into 8 ohms. Reference output of 1 watt into 8 ohms was obtained with the volume control set to 59. All are worst-case figures where applicable.

#### Output at clipping (1 kHz, watts/dBW)

one channel driven (8 ohms) .....151/21.75  
one channel driven (4 ohms) .....74/18.75  
five channels driven (8 ohms) .....46/16.5

#### Distortion at 1 watt (THD+N, 1 kHz)

8/4 ohms .....0.02/0.02%

#### Noise level (A-wtd, 16-bit signal) .....-73.3 dB

#### Excess noise (with sine tone)

16-bit (EN16) .....+0.4 dB

#### Frequency response

20 Hz to 20 kHz +0.3, -0.2 dB

#### Subwoofer-output frequency response

24 dB/octave rolloff above -3-dB point of 80 Hz

#### High-pass-filter frequency response

12 dB/octave rolloff below -3-dB point of 80 Hz

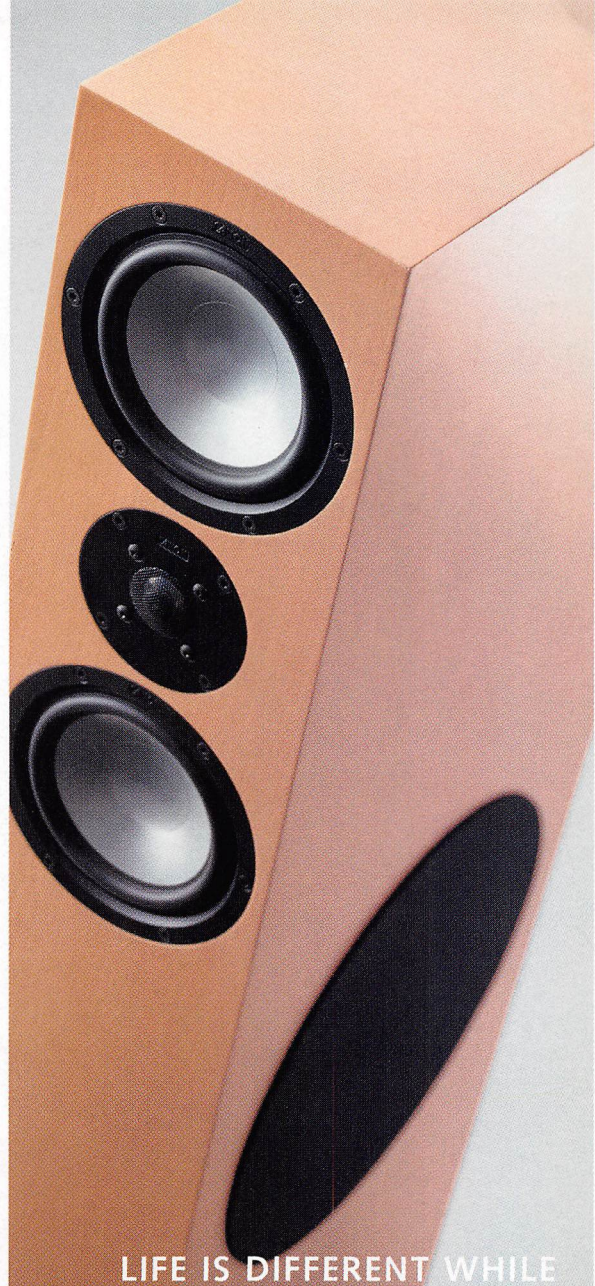
#### Maximum unclipped subwoofer output

(at reference volume setting) .....9.5 volts

Subwoofer distortion (6-channel, 30-Hz, 0 dBFS signal played at reference level; subwoofer trim 0) .....2.1%

Nearly every test-bench result from Onkyo's TX-DS696 was exemplary. Noise and distortion were near theoretical limits in all modes, and amplifier power output was more than ample with 8-ohm loads. Output into 4-ohm loads was restricted, however, to roughly 50% of 8-ohm power by the receiver's rear-panel impedance switch. When I tried driving 4-ohm loads with the switch in the 8-ohm position, the receiver limited its output for self-protection. The same thing occurred when it was driving five 8-ohm loads simultaneously, effectively limiting output in that case to around 50 watts. I must note that there's very little likelihood of this ever happening in real-world home theater playback.

Analog-input tests of Dolby Pro Logic II performance in its Movies mode showed minimum channel separation to be 34 dB (center to surround) and A-weighted S/N to be 69.2 dBW. Front- and center-channel input overload were around 0.3 dB referred to 2 volts and 1.4 volts, respectively. In contrast to standard Pro Logic performance, all five channels showed unrestricted high-frequency response; only the surround channels exhibited a fixed 80-Hz rolloff. Other results were substantially similar to Dolby Digital performance. — D.K.



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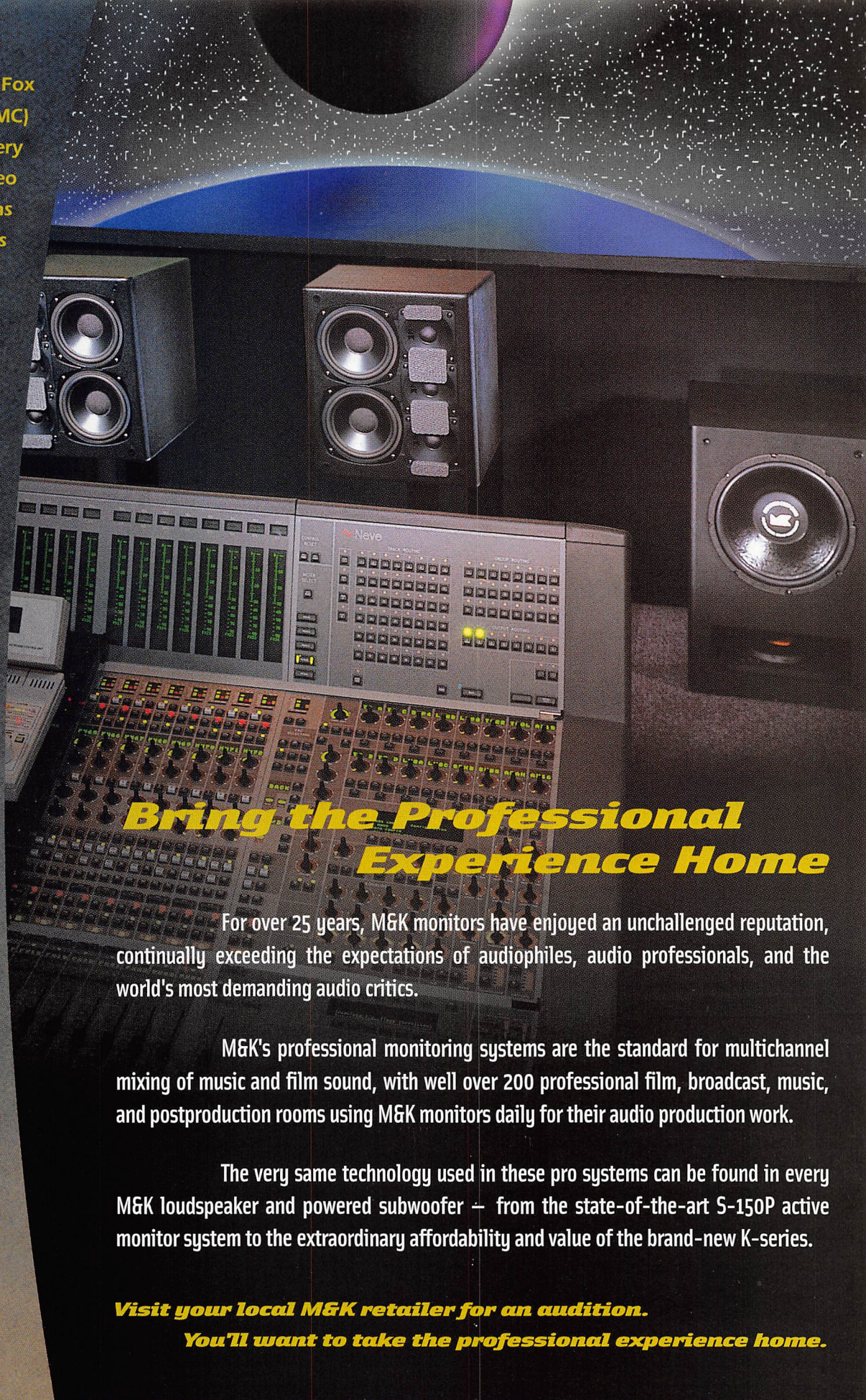
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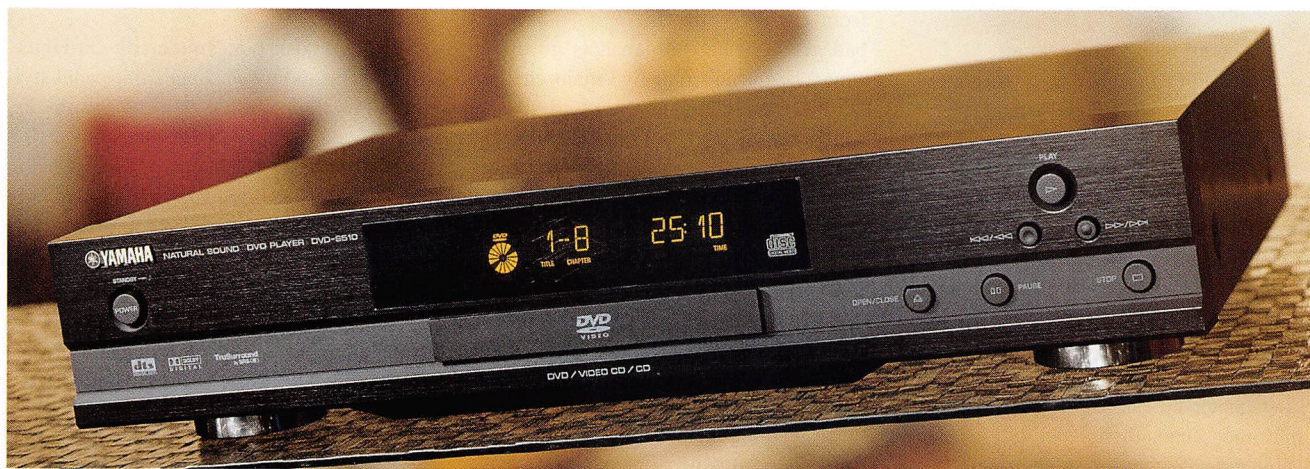
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# Yamaha

## DVD-S510 DVD-Video Player



**K**arl Marx is probably spinning in his grave, but the fact is that capitalism is a magnificent thing. Sure, unchecked corporate development is destroying the rain forests, our gasoline engines are sucking the planet dry of petroleum, and global warming will eventually melt the polar ice caps and flood all land masses. But in the meantime, unrestrained capitalism and the rampant technological growth it makes possible sure are fun. For example, early DVD-Video players had fewer features than a Soviet-era tractor and were so expensive only members of the Politburo could afford them (okay, I'm exaggerating a trifle). Today, thanks to the fiercely competitive forces of global capitalism, anyone in the industrialized world can afford a DVD player, and typical player features are rising faster than the sea level.

Case in point: the Yamaha DVD-S510. It's not the cheapest DVD player you'll find today, but at \$299, it's still modestly priced. Its front panel is simple and plastic, but not annoyingly gaudy. The plastic disc tray has about as much mass as a CD jewel box, but at least it opens and closes quickly. As with other players, the real control lies in the remote. The one supplied with the DVD-S510 is as modest and functional as the player itself — no joystick, no back-lighting, no glow-in-the-dark buttons.

Installation of the DVD-S510 was rou-

time. Using appropriate cables, I connected its optical digital and analog audio outputs to my receiver and its component-video outputs to my widescreen monitor. I tended to the minimal setup chores, like checking that the digital outputs were enabled and that English was the selected menu and subtitle language. I selected a 16:9 aspect ratio.

Before settling in for the feature presentation, I checked out the player's basic feature set. It provides still picture and frame-by-frame playback, forward/backward slow motion at 1/2, 1/4, and 1/8 speeds, forward/backward fast searching at 4x, 8x, and 32x speeds, A-B repeat, and picture zoom at 1.33x, 2x, or 4x. There's also TruSurround virtual surround sound for two-speaker setups.

All these features worked as advertised, but not necessarily without limitations. For example, with most players, you have to simply hit the forward button one or more times to search ahead on the disc. The DVD-S510's remote does not have search buttons, so you must either press and hold down the track-skip buttons or else call up an onscreen menu, find the Fast icon, drop down that menu, and select the speed you want. Either way is unnecessarily cumbersome. The zoom feature is nice, but it works only when the picture is paused. On the upside, you can pan the zoomed image using the cursor keys.

Overall, I thought the onscreen menu was too cryptic. An optional display shows audio, video, and total bit rate as a DVD plays. It's fun in a geeky kind of way, but the bar-graph indicators give only a rough idea of the actual rates. Finally, DVD players generally are in no rush to initialize and start playing discs, but this one seemed a tad slower than other players I've used.

To check out the player's video and audio performance, I loaded *The Art of War*, an action movie starring Wesley Snipes that has virtually nothing to do with the 2,000-year-old Chinese text whose title it rips off. Anyway, in the movie covert agent Snipes battles numerous baddies to save himself, his friends, the United Nations, and Chinese-American relations (such as

### fast facts

#### KEY FEATURES

- Compatible with both CD-R and CD-RW recordable discs
- SRS TruSurround virtual surround sound

#### OUTPUTS

**video** component, S-video, and two composite  
**audio** coaxial and optical digital, two analog stereo

**DIMENSIONS** 17 1/8 inches wide, 3 5/8 inches high, 12 3/8 inches deep

**WEIGHT** 7 1/4 pounds

**PRICE** \$299

**MANUFACTURER** Yamaha, Dept. S&V, 6660 Orangethorpe Ave., Buena Park, CA 90620; [www.yamaha.com](http://www.yamaha.com); 800-492-6242



# test report

## HIGH POINTS

Component-video output.  
Excellent audio performance.  
Plays CD-R discs.  
Quick track access after initialization.  
Good value.

## LOW POINTS

Unremarkable styling.  
Slow disc initialization.  
Cryptic menu icons.

they are). He employs high-tech gadgets, jumps from lots of tall buildings, and kung-fu kicks anyone who looks at him funny. I wasn't expecting much from this flick, but I enjoyed its stylish (but sometimes graphically violent) action and occasional editing finesse.

In Chapter 11, cars drive through a misty, nighttime scene, their headlights casting visible rays of light through the fog. Bright yellow explosions punctuate the darkness, and a gunman enters a van, the ruby laser on his pistol sending a pencil-thin red beam through the smoke and haze. Poor MPEG-2 video decoding can make mincemeat out of scenes like this, with tiling artifacts around the sudden bright explosions and uneven gradations in the illuminated haze. The DVD-S510 had no problems, and the scene looked clean, though without quite as much depth as I've seen with the very best players.

Chapter 15 shows us how to unlock handcuffs with a piece of wire. There is a quick closeup of the hero's hands — the DVD-S510 clearly showed the grain on the sleeve of his leather jacket. But a careful comparison with my high-priced reference player showed the S510's picture wasn't as finely detailed. Chapter 17 offers some stylish cinematography with bright headlights, shiny rain-slicked streets, reflections of light from pools of water, bonfires, and even reflections from a woman's eyeglasses. All of this was conveyed cleanly, without visual problems. This player might not have the very best video in the world, but it's darn good.

*The Art of War's*  
Dolby Digital 5.1-

channel soundtrack is pretty much standard action fare, but it does occasionally try to match the elegance of the movie's visuals. Chapter 12 demonstrates how to escape from an SUV full of bad guys. When the gunshots go off, the sound is placed in all five main channels, with the sound to the surround speakers slightly delayed to give a sense of blasts in a confined space. At the end of the chapter, when the SUV drives full speed into the business end of a forklift, a healthy explosion rocks the scene.

In Chapter 15, it's not entirely clear why we hear the sound of a tenor singing an aria as the hero climbs the stairs of an abandoned warehouse, but in today's crass world, I appreciate any tidbits of culture I get. I also appreciated the nice reverberation placed on the aria, which gave it a spooky omnipresence. The DVD-S510 delivered a glitch-free audio bitstream, although it was my receiver that did most of the work of turning it into sound.

Turning to the music side of the equation, I checked the DVD-S510's own digital-to-analog (D/A) converters with *Shaking the Tree*, a compilation of Peter Gabriel hits. "Mercy Street" is one of my favorite tunes, an understated composition that opens mysteriously with a synth drone, establishes an ostinato line of tabla and detuned triangles, and adds a doubled vocal line. The mix is incredibly clean, and the DVD-S510 reproduced its finesse without complaint. Details like the dropped-in bits of reversed and flanged vocals or the occasional reverberation added to the vocals were clearly audible. This vintage tune was recorded on analog tape, and the tape hiss is unfortunately obtrusive, but the DVD-S510 reproduced it faithfully. In short, its audio performance was excellent.

Virtually all DVD-Video players play rewritable CD-RWs, but relatively few can handle write-once CD-Rs. The DVD-S510 can play both. On the downside, it was even slower at initializing CDs than it was with DVDs — not a big deal unless you're impatient. On the up side, after initialization the player was quite speedy in moving between tracks.

The small flaws I found in the DVD-S510 aren't any worse than in other budget-price players. Like them, the DVD-



The Yamaha DVD-S510 spared none of the mayhem as Wesley Snipes demonstrated *The Art of War*.

S510 cuts costs (and your credit-card interest payments) by slashing front-panel styling niceties, remote-control gimmicks, trick features, and video tweaks. Instead, it sticks with the essentials of clean analog audio, reliable digital audio, and suitably crisp video decoding. Elevating it above the bare-bones budget models are its component-video output and CD-R playback, which are sensible choices as upgrade features unless you need something really fancy. Hey, the DVD-S510 may be more of a tractor than a sports car, but it's a far better tractor than Marx ever drove.

S&V

## in the lab

### DVD-VIDEO PERFORMANCE

Measurements were made from a variety of DVD test discs, all through the player's composite-video output except as noted.

Maximum white level.....+2 IRE  
Setup level (switchable) .....+7.5/0 IRE  
Differential gain .....3.75%  
Differential phase .....5.5°

### Luminance frequency response

(re level at 1 MHz)  
at 4 MHz.....-0.45 dB  
at 5 MHz.....-1.41 dB  
at 6 MHz.....-2.5 dB  
at 6.75 MHz (DVD limit).....-2.7 dB

Onscreen horizontal resolution.....540 lines

Pixel cropping.....left 5, right 5, top 0, bottom 2

In-player letterboxing.....good

### Component-output level error

(Y/P<sub>r</sub>/P<sub>b</sub>).....-5.6/+0.19/+1.04%

### Component-output timing error

(P<sub>r</sub>/P<sub>b</sub>).....+5/+4 nanoseconds

The Yamaha DVD-S510's test-bench performance was generally excellent, if not quite state of the art. The luminance frequency response, while not ruler flat, did not roll off as much as on some players we've tested recently. And — a surprise — the in-player letterboxing was actually good instead of poor as usual. The audio performance was also not quite state of the art, but our measurements indicate audible performance that will satisfy even critical listeners.

— David Ranada





# PSB

## Alpha Series Home Theater Speaker System



tal cabinet sized for set-top placement. The Alpha B has identical drivers, too, but only one of each. It has both threaded-insert hardware and keyhole slots on the back to make wall-mounting easier. All the main speakers in this system share simple, clean lines set off by subtly curved front baffles and handsome metal grilles. The SubSonic 5, in contrast, is about as plain a black box as you'll find: square, unadorned, and basic, with a cloth grille.

Setup for this PSB sextet was simple. The Alpha Ts come with both screw-in spikes and rubber feet; for my carpeted studio I used the spikes. Since the Alpha T is shorter than typical "tower" speakers, its acoustic center is a good bit lower than I'm accustomed to, so I tilted both towers back a little by adjusting their floor spikes. The Alpha C went on top of my 30-inch wide-screen TV and the surrounds on high side shelves slightly behind the main listening position, aimed inward and a bit to the back. I put the SubSonic 5 just behind and to the right of the left front Alpha T, a sub-

When Canadian maker PSB introduced its original Alpha bookshelf speaker in 1991, it was just another two-way minispeaker — though an unusually good one and an exceptional value. But in the ensuing decade, the Alpha has evolved into a line of eleven models, including minis, floor-standers, center speakers, and powered subwoofers. To update us on the current state of affairs in Alpha-ville, PSB sent along a mix-and-match collection of its Alpha series speakers suitable for a home theater system — a couple of Alpha T floor-standing speakers as the front left/right pair, an Alpha C center speaker, and a pair of Alpha B bookshelf speakers for the surrounds — plus a SubSonic 5 subwoofer. All but the sub are brand-new models.

The Alpha T has a somewhat unusual driver layout that puts the tweeter between two woofers. The Alpha C is very similar — same drivers, but in a smaller, horizon-

### fast facts

	ALPHA T (L/R front)	ALPHA C (center)	ALPHA B (surround)	SUBSONIC 5 (subwoofer)
<b>TWEETER</b>	¾-inch aluminum dome	¾-inch aluminum dome	¾-inch aluminum dome	—
<b>WOOFER</b>	two 5¼-inch cones	two 5¼-inch cones	5¼-inch cone	10-inch cone
<b>ENCLOSURE</b>	vented	vented	vented	vented
<b>POWER</b>	—	—	—	65 watts
<b>INPUTS/OUTPUTS</b>	biwirable gold-plated binding posts	gold-plated binding posts	gold-plated binding posts	line-level and gold-plated binding-post speaker-level inputs, binding-post high-pass output
<b>DIMENSIONS (WxHxD)</b>	6½ x 35¼ x 12 inches	17¼ x 6½ x 9¼ inches	6½ x 11¼ x 9¼ inches	12¾ x 16½ x 14 inches
<b>WEIGHT</b>	30 pounds	15 pounds	9 pounds	21 pounds
<b>FINISH</b>	black ash or light cherry vinyl	black ash vinyl	black ash or light cherry vinyl	black ash vinyl
<b>PRICE</b> Total: \$1,476	\$549 a pair	\$229	\$249 a pair	\$449
<b>MANUFACTURER</b> PSB Speakers, Dept. S&V, 633 Granite Ct., Pickering, Ontario L1W 3K1; <a href="http://www.psbSpeakers.com">www.psbSpeakers.com</a> ; 800-263-464				



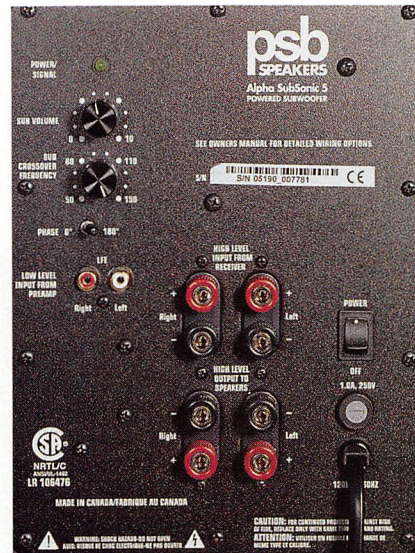
# test report

woofer location I've arrived at through numerous trials. Hookup presented several options, but I started off with speaker-level connections, letting the Alpha Ts run full-range and setting the sub's level and crossover at the SubSonic 5's control panel.

Right from the start the Alpha T impressed me as an unfailingly smooth, accurate vocal reproducer. Both male and female voices sounded natural, open, and unforced, coming very close to matching my reference stereo speakers, which originally cost a good deal more than the entire six-piece PSB array. Fiona Apple's in-your-face vocal on "Get Gone" from *When the Pawn* . . . sounded, well, in your face — but naturally so. The T's treble balance was neither recessive nor spitty but just about spot-on. Highs were clear, crisp, and detailed. Overall, the Alpha Ts sounded just about perfectly balanced on pop music. Only a slight breath of male-voice "hoo" (a subtle sort of midrange warmth) distinguished them from my reference speakers

on unadorned vocals like Lou Reed's cut-to-the-bone baritone on the title track from *Ecstasy* (Reprise). On its own, the Alpha T deserves attention as a modestly priced stereo speaker.

Deep-bass performance of the Alpha T/SubSonic 5 combination was very good, showing virtually none of the shortcomings typical of small-satellite systems, such as a persistent leanness or midbass boom. I attribute this satisfying result at least in part to the lower than usual crossover frequency I dialed in by ear on the SubSonic's control panel — at a guess, about 60 Hz. I also experimented with the very flexible line-level crossover provided by my B&K AVR307 receiver, settling on an even lower 50-Hz setting with a steep (24-dB-per-octave) low-pass filter and a mild, 6-dB-per-octave high-pass filter on the signal to the Alpha Ts. To my ears, this arrangement provided an even better integrated sound for bass guitar and orchestral strings. But the difference was subtle, so there's no



need to worry if you don't have such a flexible crossover.

I couldn't resist trying the Alpha Bs with stereo music, too. They sounded essentially identical to the Alpha Ts, with a little less bass and lower maximum undistorted volume. As a result, during high-volume listening some things — like the crisp piano-and-snare-drum hits on the Apple CD's opener, "On the Bound" — lacked a bit of the clarity and "smack" they had on the bigger speakers. Indeed, the Alpha B is a ridiculously good speaker all around for its low price of \$249 a pair, and I like the light-cherry finish (see photo).

Turning to multichannel movie soundtracks, I found the sound equally good. The Alpha T/Alpha C trio worked fine for front-stage imaging. Broadly panned sounds that moved from far left to far right, or vice versa, held together quite well, though they were occasionally elevated relative to the sides because the C was placed higher than the Ts. This effect was clearly demonstrated by the law-enforcement ballet (with techno score) that opens *The Watcher* — when the cop car slides to a halt from one side of the screen to the other, its screech seemed to lift up and then fall back down as it passed through the center speaker. (Is it just me, or are fully 50% of Hollywood movies about creepy serial killers?) For a permanent setup, I would try to lower the TV by 6 inches or so, which would eliminate this minor distraction.

The center speaker sounded articulate and clear, with just a hint of midrange emphasis — which actually enhanced intelligibility a bit. Heard well off-axis, the Alpha

## in the lab

### FREQUENCY RESPONSE (at 2 meters)

front left/right	66 Hz to 15.4 kHz $\pm 4.5$ dB
center	90 Hz to 19.2 kHz $\pm 2.5$ dB
surround	90 Hz to 12.6 kHz $\pm 3.6$ dB
subwoofer	31 Hz to 100 Hz $\pm 3.5$ dB

### SENSITIVITY (SPL at 1 meter with 2.8 volts of pink-noise input)

front left/right	92 dB
center	92 dB
surround	90 dB

### IMPEDANCE (minimum/nominal)

front left/right	5.5/8 ohms
center	5.3/8 ohms
surround	4.1/8 ohms

### BASS LIMITS (lowest frequency and maximum SPL with limit of 10% distortion at 2 meters)

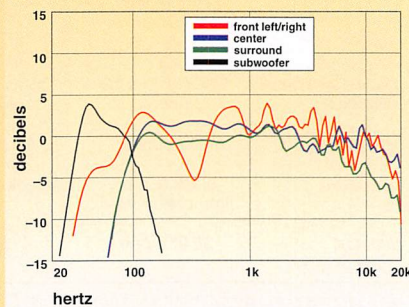
front left/right	40 Hz at 84 dB SPL
center	40 Hz at 76 dB SPL
surround	50 Hz at 81 dB SPL
subwoofer	25 Hz at 87 dB SPL
100 dB average SPL from 25 to 62 Hz	
108 dB maximum SPL at 62 Hz	

All of the response curves in the graph are weighted to reflect how sound arrives at a listener's ears with normal speaker placement. The Alpha T is a tower-style speaker, so all measurements were made with it on the floor. It suffered from the 300-Hz floor-bounce notch common to floor-standing speakers. Otherwise, response was reasonably smooth, with some roughness at higher frequencies but exceptionally uniform off-axis performance.

The Alpha C had excellent on-axis performance whether placed horizontally or vertically. Response remained exceptional off-axis when

the speaker was vertical, but a deep two-octave-wide notch (somewhat worse than average) formed when it was positioned horizontally. The Alpha B displayed a fairly wide peak centered at 1.5 kHz and some roughness at higher frequencies, but off-axis response was remarkably uniform over a full 120° listening window.

Bass limits for the SubSonic 5 subwoofer were measured with it set to maximum bandwidth and placed in the optimal corner of a 7,500-cubic foot room. In a smaller room, users can expect 2 to 3 Hz deeper extension and up to 3 dB higher sound-pressure level (SPL). The SubSonic 5 had very little interaction between the crossover and level controls. However, the actual turnover frequencies were significantly lower than the dial markings at all but the lowest settings. The average SPL over the 25- to 62-Hz bandwidth was only slightly above average for a moderate-price subwoofer, but not many under-\$500 subs can produce 87 dB at 25 Hz with low distortion. — Tom Nousaine





## HIGH POINTS

Excellent musical and vocal balance.

Deep bass with ample output.

Superb value.

## LOW POINTS

Lower-than-usual acoustic center  
in front L/R pair.

Center speaker has audible off-axis  
tonal shift when placed horizontally.

C suffered from a modest dose of the male-vocal hootiness that dogs most horizontally oriented, dual-woofer center speakers. But as long as the listening area remains no wider than, say, a family-size couch, I wouldn't expect this to be a problem.

The overall system played surprisingly loud — a good 10 dB louder than typical compact systems built around 4-inch (or smaller) woofers. And 10 dB is a lot! The ultimate dynamic limitation was set by the Alpha Bs, which produced a bit of port noise when pushed really hard with bass-rich surround material, like the hovering

choppers in the opening of *The Watcher*. Using a higher crossover point — 80 Hz, say, which is more typical for home theater systems — put less strain on the Bs by sending deeper surround-channel bass to the subwoofer.

I've come to expect solid performance from PSB subwoofers, and the SubSonic 5 didn't disappoint me. The compact sub played as low as I'd expect any 10-inch driver to manage (down to about 32 Hz), with ample volume for the sort of real-world listening I do, which is at least 6 dB below THX reference levels. The SubSonic 5 couldn't match my everyday 12-incher on the most demanding stuff, like the T-Rex footfalls in *Dinosaur* — I didn't feel them in my chest or gut — but in most other respects I was hard-pressed to find fault. It didn't boom or rumble excessively, it was smooth sounding in the 40- to 80-Hz octave, and it produced no port noise or other audible signs of distress. What more could I ask of a sub-\$500 sub?

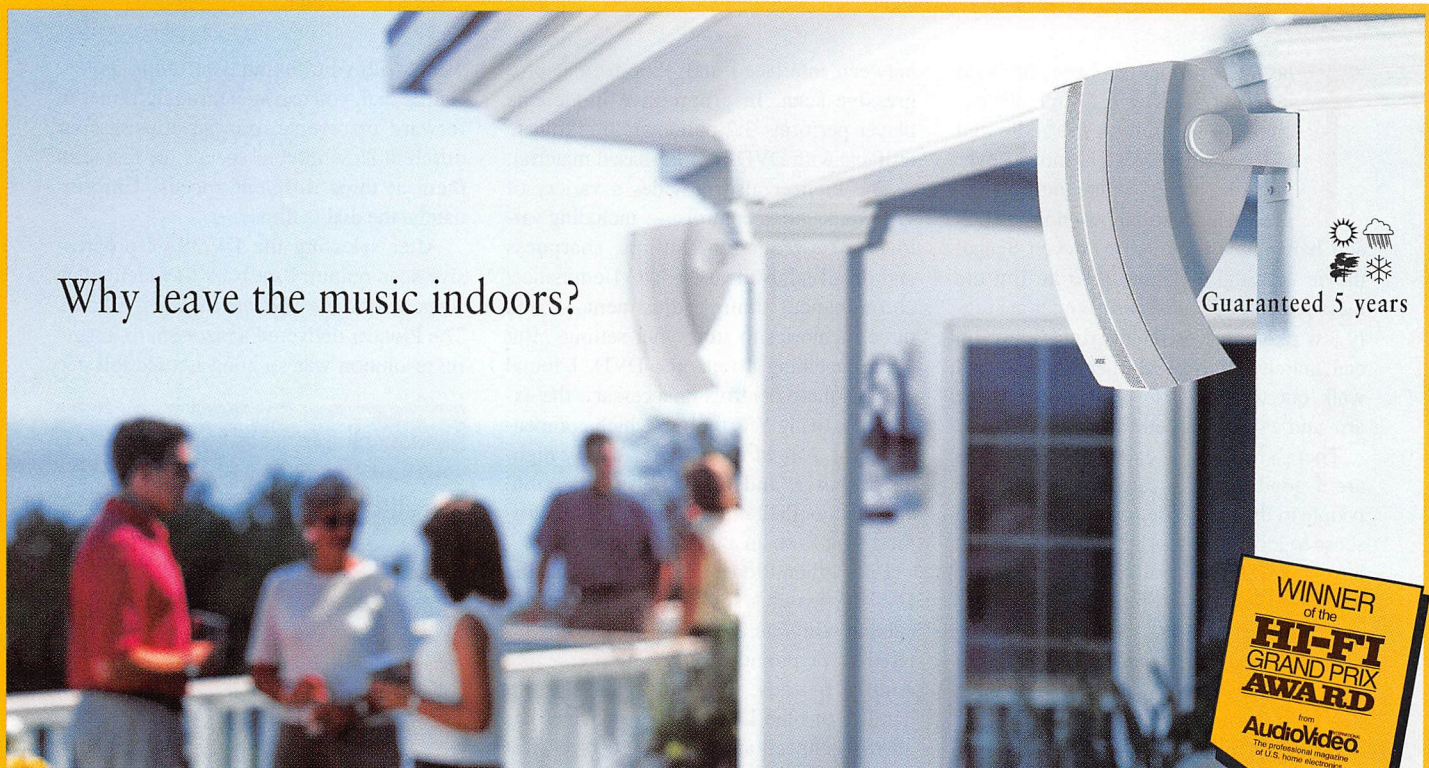
The PSB Alpha suite is a really good



**The bass-rich material in *The Watcher*, starring Marisa Tomei and James Spader, posed a challenge that the PSB Alpha speaker system met handily.**

home theater speaker system — and an even better value. The thrifty among us might note that for modest-size rooms where flexible subwoofer-placement options (or an adaptable crossover) will let you get the bass right, a system using four Alpha Bs, a C, and a SubSonic 5 might serve just about as well, and at a savings of some \$300. Either way, if you're a dollar-conscious shopper — and especially if stereo (and surround) music is as important to you as movies — you owe it to yourself to give the new PSB Alphas an audition. **SW**

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# Pioneer

## DV-38A DVD-Audio/Video Player



**T**he DVD format has been shrouded in buzz from Day 1. At first, the excitement focused on the audio and video quality. Next, it moved over to cool features — like multiple angles (whatever happened to those?) and being able to watch a Steven Seagal movie with the dialogue in Urdu. But the most recent buzz has been about amazingly low player prices. That's right, now you can march into Wal-Mart with \$150 and walk out with a DVD player under your arm and a smile on your face.

There's no doubt cheap DVD players are a good thing — they introduce more people to the format — but it can still make sense to look at factors besides price. If you have an HDTV, for example, you probably want a player with a progressive-scan output to take advantage of your set's extra resolution. And if music is important to you, you'll also want one that can play the new high-resolution DVD-Audio discs.

Pioneer's Elite DV-38A has both features. But with a \$2,000 list price, you'd expect it to have a few more tricks up its sleeve, and it does. Besides standard interlaced composite/S-video outputs, it has a component-video output that's switchable

between interlaced and 480p-format progressive scan. In progressive mode, the player performs 3:2 pulldown to eliminate artifacts with DVDs of film-based material.

The Pioneer also provides a variety of video processing controls — including various noise-reduction settings, sharpness and detail adjustments, a Y/C (luminance/chrominance) timing adjustment — and three memories to store your settings. But while watching a topnotch DVD, I found most of these controls unnecessary, the exceptions being Y/C timing, which compensated for a slight timing error on my high-def monitor, and block noise reduction, which smoothed out MPEG-encoding artifacts visible on an animated movie.

Like other Pioneer Elite products, the DV-38A features slick styling and a hefty cabinet with fine fit and finish. The uncluttered front provides only a few essential control buttons, a display panel, and a handful of blue LEDs. The rear panel has all the connections you'll need (see "fast facts" at right).

The DV-38A's remote control is comfortable to hold. Although it's crammed with buttons, the entire keypad glows in the dark to help you find the button you

want. With your thumb controlling its jog/shuttle dial, you can step through frames in forward or reverse, browse clips at four different slow-motion speeds, or fast-scan them at three different speeds. Unfortunately, the dial is flimsy.

After selecting the DV-38A's progressive-scan output, I sat back to watch a few scenes from *The Mummy Ultimate Edition*. The Pioneer delivered a razor-sharp image. Its resolution was so good I could tell one

### fast facts

#### KEY FEATURES

- Plays DVD-Video and DVD-Audio discs
- Progressive-scan component-video output with 3:2 pulldown
- Extensive video controls
- Illuminated remote control

**OUTPUTS** component video (switchable for interlaced or progressive scan), two composite/S-video; coaxial and optical digital audio; analog stereo and six-channel

**DIMENSIONS** 18½ inches wide, 5¼ inches high, 14½ inches deep

**WEIGHT** 22 pounds

**PRICE** \$2,000

**MANUFACTURER** Pioneer Electronics, Dept. S&V, 2265 E. 220th St., Long Beach, CA 90810; [www.pioneerelectronics.com](http://www.pioneerelectronics.com); 800-746-6337



# OVERLOAD



TX-DS787

model

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# test report

## HIGH POINTS

Generally excellent progressive-scan performance.

Excellent fit and finish.

## LOW POINTS

Progressive-scan glitch.

Flimsy jog/shuttle on remote control.

Pricey.

character was wearing a linen shirt — the coarse weave of the fabric came through that clearly.

With tough test material like Chapter 8 of *Dragonheart* and the opening of *Star Trek: Insurrection*, in which the camera moves over a complex array of lines, surfaces, and textures, the player's progressive-scan output delivered seamless, filmlike images. The scenes were rendered smoothly, with no trace of noise or stairstep artifacts on diagonal lines or solid edges.

The only problem I encountered was a

raggedness, or pixelization, on the edges of objects with highly saturated colors. I could detect this "combing" artifact most clearly in the Beatles' animated *Yellow Submarine*. In "Ringo's House," for example, there was a sawtooth edge to the transitions between red and blue in Ringo's striped suit. When viewed using the player's interlaced output, the edges were smooth and straight. To put things in perspective, however, the effect is visible on only a limited amount of program material, and the same thing has cropped up with every other progressive-scan DVD player we've tested except a \$3,000 non-DVD-Audio model.

As with other DVD-Audio players, the DV-38A's bass management applies only to output from its built-in Dolby Digital/DTS decoder. Fortunately, this didn't pose any problems with my speaker setup, which includes both a subwoofer and five full-range speakers. Listening to "Space

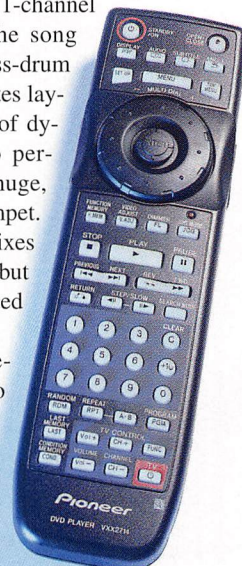


The DV-38A's progressive-scan output revealed the secrets of *The Mummy Ultimate Edition* DVD.

Truckin' " from the multichannel remaster of Deep Purple's *Machine Head* (the last time I heard it was on an in-dash eight-track player!), I wasn't thrilled to have Ian Paice's drums blaring at me from the surround channels, but his cymbals seemed remarkably warm and lifelike. Next up was my all-time Deep Purple favorite, "Highway Star." The surround panning struck a nice balance between subtle and adventurous, with the keyboard making an exciting 360° swirl at the outset of Jon Lord's solo.

The player took a painfully long time to respond to commands — in some cases, up to 5 seconds — when I was listening to DVD-Audio discs. This wasn't a big deal most of the time, but with most of the artsy, navel-gazing songs on *Immersion* (Starkland), I couldn't skip to the next track fast enough. One track, however, Bruce Odland's "Tank," struck me as a wonderfully creative application of 5.1-channel technology to music. The song starts off with a low bass-drum foundation and accumulates layers through the addition of dynamically panned mono percussion samples and a huge, reverberant wash of trumpet. Many surround music mixes sound unnatural to me, but this aggressive mix sounded completely organic.

With its progressive-scan output, DVD-Audio playback, and extensive video controls, the Pioneer DVD-38A has what it takes to compete for a discerning audio/video-ophile's dollar. Its only notable glitch is that progressive-scan combing artifact, which is also found with other players. You won't find this Pioneer Elite player in the Wal-Mart bargain bin, but if top-shelf performance combined with cutting-edge features is what you're after, the DV-38A deserves a serious look.



## in the lab

### DVD-AUDIO PERFORMANCE

All tests used a DVD-R of computer-generated test signals containing dither, which sets limits on measured distortion and noise performance. Results are representative. In all cases, the kHz figures in the test conditions (left) represent the sampling rate of the digital signal.

**Noise level** (re -20 dBFS, A-wtd, 24-bit signals) all sampling rates .....-92.4 dB

#### Frequency response

44.1 kHz .....20 Hz to 20 kHz +0.05, -0.01 dB  
48 kHz .....20 Hz to 21.3 kHz +0, -0.06 dB  
88.2 kHz .....20 Hz to 40.0 kHz +0, -2.0 dB  
96 kHz .....20 Hz to 42.1 kHz +0, -0.32 dB  
176.4 kHz .....20 Hz to 76.3 kHz +0, -1.74 dB  
192 kHz .....20 Hz to 83.2 kHz +0, -1.95 dB

#### Excess noise (re perfect 24-bit performance)

48 kHz .....+31.8 dB  
88.2/96/176.4/192 kHz .....+31.3 dB

#### Noise modulation

(all sampling rates) .....<0.5 dB

### DVD-VIDEO PERFORMANCE

Measurements were made from a variety of DVD test discs, all through the player's composite-video output except as noted and using the player's CRT monitor mode and its default picture settings.

**Maximum white level error** .....-1 IRE

**Setup level** (switchable) .....+7.5/0 IRE

**Differential gain** .....2%

**Differential phase** .....1°

**Luminance frequency response** (re 1 MHz) at 4/5/6/7.5 MHz .....-0.2/-0.1/-1.5/-2.5 dB

**Onscreen horizontal resolution** .....540 lines

**Pixel cropping** .....left 7, right 3, top 0, bottom 0

**In-player letterboxing** .....good

#### Component-output level error

(interlaced mode, Y/Pr/Pb) .....-1.3/-2.8/-0.9%

#### Component-output timing error

(interlaced mode, Pr/Pb) .....-1/-5 nanoseconds

In our CD tests the DV-38A had rather high noise modulation (2.75 dB), a relatively large linearity error (-1.1 dB), and excess noise that went down substantially (+2.95/+0.15 dB) when the test signal contained a sine tone (the "with sine tone" figure is usually the same). These results indicate some kind of processing for CDs that doesn't apply to Dolby Digital decoding, where the excess noise (+0.2 dB) and distortion (0.026% dB) measurements were far closer to theoretical expectations. Don't fret too much, however. I couldn't hear any degradations, and the player had no problem handling CD-R and CD-RW discs.

DVD-Audio playback was superior in all measurable respects to CD playback. In aggregate, these are the best noise results we've seen since instituting these tests. The data indicate resolution of about 18½ bits.

Video performance was very fine, with notably good in-player letterboxing and near-perfect figures for the interlaced component output. Progressive component-output performance was another matter, as Al Griffin explains.

— David Ranada



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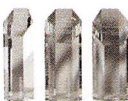
*"... most certainly a serious high-end contender, and a formidable one ... if tonal neutrality is at the top of your list of priorities for speaker performance, and you want a speaker that can play loud without sounding stressed, then you really must listen to the Reference Studio/100."*

*—Robert Deutsch, Stereophile, Vol. 23 No.6, on the Studio/100*



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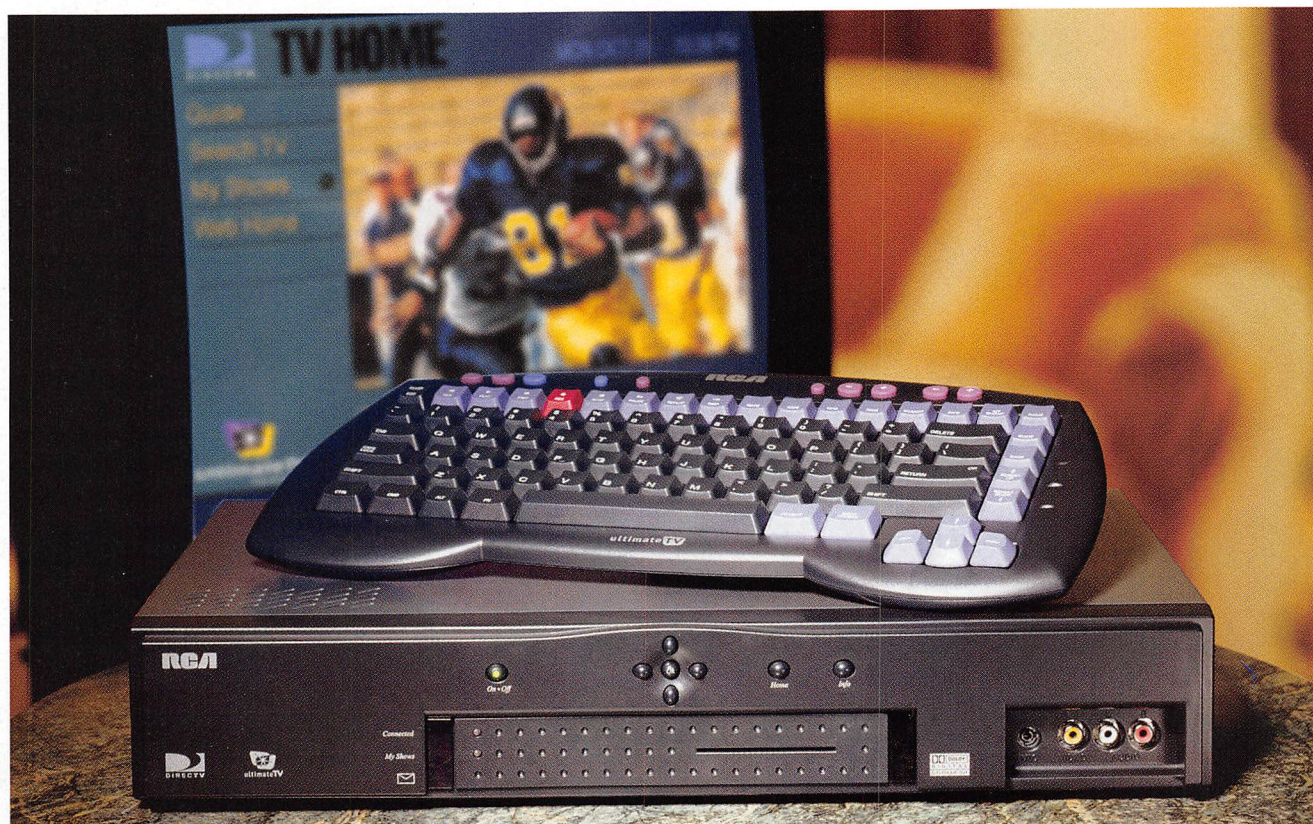
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\*An annual, independent, nationwide survey of consumer electronics specialist retailers and custom installers.



# RCA

## DirecTV Receiver with UltimateTV Service



The ongoing power shift from TV executives to viewers ensconced in easy chairs is kicked up a notch by this dual-tuner DirecTV receiver from RCA. It incorporates Microsoft's boldly branded UltimateTV service and a 45-gigabyte hard-disk recorder (HDR) that's controlled by the UltimateTV software. Neither a video HDR nor satellite delivery of hundreds of channels is new, but joining these technologies in one box along with seamless interactivity through an Internet link gives viewers unprecedented control over what they watch and how and when they watch it.

Setup was no different from other DirecTV installations, which require you or an installer to mount an 18-inch dish with an unobstructed view of the southern sky. To take advantage of both tuners, you'll need a dish with a dual-LNB output and two coaxial cables from the dish to the re-

ceiver. For Internet connection, you hook up the internal 56-kilobits-per-second (kbps) modem to a phone line. The modem also dials into DirecTV for pay-per-view billing.

A DirecTV subscription starts at \$22 a month, and UltimateTV offers three service options. Basic UltimateTV (an oxymoron if there ever was one) costs \$9.95 a month and includes 3 hours of Internet connection time, six e-mail accounts, the program guide, and access to the hard drive and receiver. If you connect using your own Internet service provider (but not AOL because of its proprietary software), you get all of the above without time restrictions for \$14.95 a month. For unlimited time with WebTV as your Internet service provider, you'll pay \$29.95 a month.

Once DirecTV and UltimateTV were activated, I found the video streaming from the hard drive to be of excellent quality. But you can't trade off recording quality

for more recording time as you can with other HDRs, since all the compression is done by DirecTV before the programs are beamed up to the satellite. While this is an efficient way to pack the hard drive with 30 to 35 hours of programming, the downside is that DirecTV is the only program source. Since the receiver doesn't do any digital encoding, only video decoding, you can't use the HDR to buffer or time-shift cable or local broadcast channels — although in larger cities you can pay to receive local channels via DirecTV. There's a pass-through RF connection on the UltimateTV receiver for one non-DirecTV source (like a cable box or VCR) and a toggle on the remote so you can select it.

Like other HDRs, this one doesn't do Dolby Digital decoding, but it does have a pass-through digital audio output, so you can send the Dolby Digital soundtracks of programs you record to an outboard de-



coder and hear them in sync with the video. With a stand-alone HDR, you have to settle for analog stereo; otherwise the digital audio sent directly to your receiver would be out of sync with the buffered video sent to your TV.

But the UltimateTV system's most compelling feature may be as a peacekeeper in a multiperson household because it lets you record two shows at once. You can even watch two shows at once with a picture-in-picture window — this is the first satellite receiver with dual-tuner PIP capabilities. For example, I set it to simultaneously record a Yankees game on Fox and *As the World Turns* on CBS. How's that for maintaining détente in a home where the struggle for control of the remote is like war between Mars and Venus? Even better, the system can be recording two shows while you watch something completely different that was recorded earlier.

Like other HDRs, this one goes way beyond basic time-shifting. Want to see that shortstop's error again? Hit the Instant Replay button to watch the last 7 seconds. Like TiVo and ReplayTV hard-disk recorders, the RCA automatically buffers at least 30 minutes of whichever two shows its

tuners are set to — even if you haven't told it to record them. (Just don't change a channel, or you'll empty the buffer.) This feature lets you hit pause to answer nature's call without missing a moment of the program you were watching. All of the buffering and recording functions are disabled, however, when you're tuned to DirecTV's audio channels — so much for time-shifting music programs.

Like ReplayTV recorders, the RCA recorder includes a Skip button that lets you bypass a 30-second commercial in a flick. Its 2x and slow-motion speeds are exquisitely smooth, while its 15x, 60x, and 300x forward and reverse scans (faster than any rival HDR) let me get through a 3-hour XFL game in about the time it would normally take to suffer through the kickoff. Once you pause a program, you can step forward through it frame by frame.

Having used many electronic program guides over the years, I found a lot to admire in UltimateTV's guide, which is based on the one provided for WebTV Plus, but also several things that weren't so hot. With information from DirecTV's 14-day guide delivered by satellite and stored in the receiver, the UltimateTV guide is easily the most searchable I've seen. It helps, of course, to use the optional (\$49) wireless keyboard instead of RCA's universal remote with an onscreen keyboard, but either way you can search across all fields, including program descriptions. Type in "framed for a crime," for instance, and you'll see a list of every show on tap whose synopsis contains that phrase. The Search TV screen retains a list of recent searches.

Another way to search is by theme. I checked off three categories — Action/Adventure, Fantasy, and Sci-Fi — and UltimateTV returned a long list of shows I might be interested in watching. Clicking on a title brings up a program description and the choice of being reminded to watch the show when it's on or having it automatically recorded. In general, the program guide is extremely flexible. You can view it by favorite channels or by day and time,



**You can watch — and record — two football games at once with the RCA DirecTV/UltimateTV system.**

and you can either retain the channel you were watching in a PIP window or have the windowed program change as you scroll through listings.

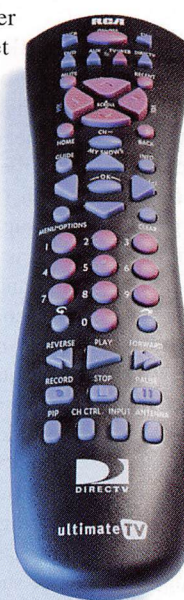
Once you're finished searching and hitting the record button, you'll end up at the My Shows screen, where you can start playback of any show that's been recorded on the hard drive or check what upcoming shows are due to be recorded.

The My Shows screen also alerts you to any recording conflicts. Given my weakness for girls with guns, sometimes even two tuners aren't enough.

My objections to the UltimateTV guide concern performance speed and screen clutter. Whenever I hit the guide button while watching TV, I had to wait at least a couple of seconds before any information appeared. I'm used to instant info, and the guides included with RCA's TV sets and other DirecTV receivers are much snappier. Then there's the matter of screen real estate, up to a quarter of which has been sold to advertisers. Considering that you're already paying a monthly subscription fee for the UltimateTV service, this adds insult to injury.

Perhaps I wouldn't be so miffed if there were only a few channels and a handful of time slots. But given such a lengthy roster and the recorder's ability to serve up so many wee-hour movies for later prime-time viewing, I was disappointed that I could see only one hour and six channels of listings per screenload. Trying to plan my viewing/recording had me working the guide's directionals as feverishly as punch buttons in *Ready 2 Rumble Boxing*.

The integration of Microsoft's UltimateTV service into this DirecTV receiver reveals all the advantages and disadvantages of using a noncomputer as a Web browser. The main reward is being able to take advantage of interactive TV cues. A diamond icon in the upper righthand cor-



## fast facts

### KEY FEATURES

- DirecTV digital satellite service
- UltimateTV program guide, interactive, and Internet service
- Hard-disk video recorder

### INPUTS

**rear panel** three coaxial (two for satellite dish, one pass-through for broadcast or cable TV); composite/S-video and stereo audio (for attaching still images or sound clips to e-mail)

**front panel** microphone, composite video, and stereo audio (for e-mail attachments)

**OUTPUTS** RF, S-video, two composite video (to monitor and VCR); two stereo analog audio; optical digital audio; modem port; parallel printer port (not implemented yet); infrared emitter (for VCR control); two USB ports (for wired keyboard and possible future use)

**DIMENSIONS** 17 inches wide, 3 inches high, 11 inches deep

**WEIGHT** 16¼ pounds

**PRICES** \$449 for DS4290RE dish/receiver (\$399 for DWD490RE without dish); minimum of \$22 a month for DirecTV program package; minimum of \$9.95 a month for UltimateTV features and 3 hours of Internet use; wireless keyboard, \$49

**MANUFACTURER** RCA, division of Thomson Multimedia, Dept. S&V, 10330 N. Meridian, Indianapolis, IN 46290; www.rca.com; 800-336-1900



## HIGH POINTS

Pauses or replays programs while they're still being broadcast.

Lets you skip commercials.

Can record two channels at once and show both with PIP window.

Excellent video quality.

## LOW POINTS

Unending monthly fees.

DirecTV is the only program source.

Program guide is slow and cluttered with ads.

Incompatible with streaming and downloadable Web content.

ner of the screen indicates you can view supplemental program content on the Web while you watch the show. A "w" means the show has a dedicated Web site.

More dynamic is the link indicated by an "i." Clicking on this option lets you call up a local forecast while watching the Weather Channel, get briefings on topics discussed on PBS's *The NewsHour*, or play along with contestants on *Mall Masters* on the Game Show Network. I found this feature especially informative and fun to use while watching a recording of the hit CBS series *C.S.I.* Shamelessly, all interactivity disappears during commercial breaks so you won't be distracted from watching the ads. Of course, since I had recorded *C.S.I.*, I could still press Skip to bypass them.

E-mail with a spell checker is provided as part of the Ultimate/WebTV service, but about the only kind of file you can attach or view is a JPEG image. You can grab a frame from a broadcast and e-mail it with a comment to friends. If you were expecting to be able to take advantage of the Internet's rich media content, though, you're better off sticking with a computer. Try listening to Internet radio, for example, and you'll get the message: "The item chosen contains a kind of information that WebTV can't use." Try to access a video clip or

download an MP3 file, and you'll get the same brushoff. The service is compatible with MIDI files — you haven't lived until you've heard *Light My Fire* synthesized.

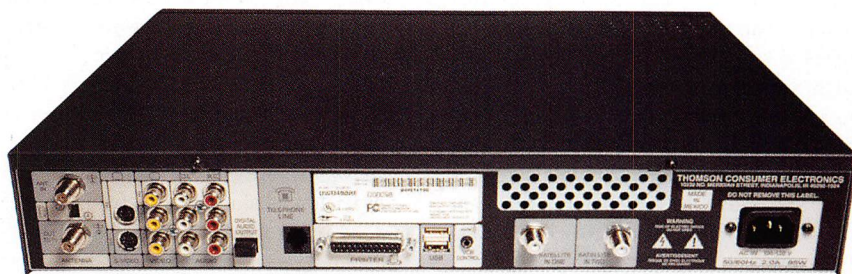
My biggest shock came when my Internet access was denied after what I considered minimal use. "You have used your 3 hours of monthly Internet access" said the error message when I tried to return to the scene of a *C.S.I.* crime. I had the options of waiting a couple of weeks until another billing cycle began so I could use my next 3 hours, or calling a toll-free number to sign up for unlimited access.

No set-top hard-disk recorder so far, including this one, supports high-definition TV (HDTV). And UltimateTV acknowledged that people who want HDTV must shop elsewhere. Two USB ports are provided, however, and though they have minimal use now, I was told that in the future one might be configured for a higher-speed Internet connection.

While the DirecTV/UltimateTV combination (which is not exclusive to RCA) may suggest too many corporate cooks, the result is a feast for the eyes, a treat for the ears, and an idiot-proof way to let whole households amicably allocate their viewing time. Any hard-disk recorder is far more convenient and capable than any VCR, and UltimateTV is also one of the best examples of interactive TV that I've used.

Still, it's not clear that leisure-oriented TV watchers will see the value in doing anything interactive beyond checking program listings and selecting what to record. Even such nifty tricks as pausing an incoming program, jumping ahead over commercials, replaying parts of a show while it's still recording, and recording two programs broadcast at the same time don't require being wired to the Web. And considering that not every household can accommodate a satellite dish or will see the logic in paying endlessly for access to a hard-disk recorder they thought they already owned, UltimateTV may ultimately be a tough sell.

S&V



AK- Alaska A/V: Juneau• Pyramid: Anchorage.  
AL- Cohen's Electronics: Montgomery• Elite Electronics: Jackson's Gap• Hooper's: Birmingham• Kincaid's TV: Tuscaloosa.  
AR- Custom Audio Video: Little Rock.  
AZ- Jerry's Audio Video: Phoenix, Scottsdale• The Specialists: Tucson• Ultimate Electronics: Phoenix Metro Area.  
CA- Access to Music: Larkspur• Accurate A/V: S. Lake Tahoe• Ahead Stereo: Los Angeles• Audio Concepts: Long Beach, San Gabriel• Audio Video City: San Luis Obispo, Santa Maria• Bay Area Audio: San Jose• Boots Camera: Fresno• Century TV: Garden Grove• CH Automation & Theater: West LA• Creative Stereo: Santa Barbara• David Rutledge Audio: Palm Desert• Digital Ear: Tustin• Discount Sales: Ontario• Magnolia HiFi: Santa Clara, San Ramon• Paradyme: Sacramento• Performance Audio: San Francisco• Shelley's Stereo Video: Woodland Hills• Systems Design: Redondo Beach.  
CO- Soundtrack: Denver & Suburbs, Boulder, Ft. Collins, Colorado Springs• Advantage Sight & Sound: Montrose• Pro Home Systems: Grand Junction.  
CT- Audio Etc.: Orange• Carstons Stereo/Video: Danbury• Roberts Audio Video: New London• The Sound Room: Westport• Stereo Shop: Hartford.  
DC & Washington Suburbs: Myer-Emco.  
DE- Hi Fi House: Wilmington.  
FL- Absolute Sound: Winter Park• Audio Center: Deerfield Beach• The Audiohouse: Vero Beach• A/V in Paradise: Key West• Bob's TV: Summerfield• Cooper for Stereo: Clearwater• Hoyt Stereo: Jacksonville• Sound Components: Coral Gables• Sound Ideas: Gainesville• Sound Insights: Ft. Pierce• Sound Waves: Lakeland• Stereotypes: Daytona Beach.  
GA- Georgia Home Theater: Atlanta• Audio Warehouse: Savannah• Ken's Stereo: Macon• Merit TV: Columbus• Stereo Connections: Valdosta• Stereo Festival: Atlanta• Stereo Shop: Martinez.  
HI- Honolulu Home Theater: Honolulu.  
IA- Ultimate Electronics: Cedar Rapids, Davenport, Des Moines• Archer Audio Video: Ft. Dodge• Audio Video Logic: Des Moines• Audio Visions: Sioux City• Hawkeye Audio: Iowa City, Cedar Falls• Renier's: Dubuque• Sound World: Mason City.  
ID- Ultimate Electronics: Boise.  
IL- Barretts Home Theater: Bloomington, W. Dundee, Aurora• Good Vibes: Bloomington, Champaign• Jon's Home Ctr.: Quincy• Music in Motion: Chicago Heights & Crestwood• Sound Forum: Crystal Lake• State Line Satellite: Rockford• Sterling Electronics: Sterling• Sundown A/V: Springfield• The Shoppe: Bradley.  
IN- Classic Stereo: Ft. Wayne, Mishawaka• Kings Great Buys: Evansville• Ovation Audio: Clarksville, Indianapolis, Lafayette.  
KS- Accent Sound: Overland Park• Advance Audio: Wichita• Audio Junction: Manhattan.  
KY- King's Great Buys: Owensboro• Long Run Audio: Paducah• Ovation Audio: Lexington, Louisville.  
LA- Absolute Audio Video: Lafayette• Alterman Audio: Metairie• Home Theater Concepts: Slidell• Mike's Audio: Baton Rouge• Wright's Sound Gallery: Shreveport.  
MA- Media Systems: Boston• Nantucket Sound: Hyannis• Pittsfield Radio: Pittsfield.  
MD- Gramophone: Baltimore, Ellicott City• Myer-Emco: Frederick, Gaithersburg, Beltsville, Rockville• Soundscape: Baltimore.  
ME- New England HiFi: Scarborough.  
MI- Contemporary Audio: Okemos• Pecar's: (Detroit) Troy• Classical Jazz: Holland• Court St. Listening Room: Saginaw• Home Entertainment Store: Kalamazoo• Paragon Sound: Ann Arbor• Superior Sound: Grand Rapids• Today's Audio: Flint.  
MN- Audio King: Minneapolis & Suburbs, Rochester, St. Cloud• Audio Designs: Winona.  
MO- Independence A/V: Independence• Sound Central: St. Louis.  
MS- Ideal Acoustics: Starkville• McLelland TV: Hattiesburg• Players A/V: Ridgeland.  
MT- Rocky Mt. Hi Fi: Great Falls• Vann's Inc.: Missoula, Helena, Bozeman, Hamilton, Kalispell, Billings, Butte.  
NC- Audio Unlimited: Jonesville• Audio Visions: Wilmington• Now Audio/Video: Durham, Greensboro, Raleigh, Winston Salem• Tri City Electronics: Conover.  
NE- Custom Electronics: Omaha, Lincoln• Midwest Audio: Kearney.  
NH- State Street Disc.: Portsmouth.  
NJ- 6th Avenue Electronics: Springfield, Livingston, East Brunswick, Woodbridge, Paramus, West Longbranch, West Paterson.  
Camera and TV Stop: Medford, Monmouth Stereo: Shrewsbury• Woodbridge Stereo: West Caldwell, Woodbridge.  
NM- Ultimate Elect.: Albuquerque• Sound Ideas: Albuquerque.  
NV- Ultimate Elect.: Las Vegas.  
NY- Audio Breakthroughs: Manhasset• Audio Den: Lake Grove• Clark Music: Albany, Syracuse• Stereo Exchange: Manhattan• Hart Elect.: Vestal• Listening Room: Scarsdale• Media Room: Mt. Kisco• Park Ave. Audio: Manhattan• Rowe Camera: Rochester• Speaker Shop: Amherst.  
OH- Absolute Theater: Powell• Audio Craft: Akron, Cleveland, Mayfield Hts., Westlake• Audio Etc.: Dayton• Belden Audio: Canton• Classic Stereo: Lima• Ohio Valley Audio: Cincinnati• Paragon Sound: Toledo• Stereo Visions: Columbus• Threshold Audio: Heath• Unique Home System: Cincinnati.  
OK- Ultimate Electronics: Tulsa.  
OR- Bradford's Home Ent.: Eugene• Kelly's Home Ctr.: Salem• Magnolia HiFi: (Portland) Beaverton, Clackamas, Tigard• Stereo Planet: Bend.  
PA- Audio Junction: Pittsburgh• Audio Lab: Fairless Hills• Ed's TV: Hatfield• Gary's Elect.: State College• Hart Elect.: Blakely• Hi Fi House: Abington, Broomall• Listening Post: Pittsburgh• Palmer Audio: Allentown• Stereo Shoppe: Selinsgrove, Williamsport• Stereoland: Natrona Heights• Studio One: Erie• The Stereoshop: Greensburg.  
RI- Stereo Discount Ctr.: Providence.  
SC- Custom Theater & Audio: Myrtle Beach• Upstairs Audio: Columbia.  
SD- Audio King: Sioux Falls• Sound Pro: Rapid City.  
TN- College HiFi: Chattanooga• Good Vibrations: Cookeville• Hi Fi Buys: Nashville• Now Audio Video: Knoxville• Modern Music: Memphis• Sound Room: Johnson City.  
TX- Audio Video: College Station• Bunkley's Sound Systems: Abilene• Bjorn's: San Antonio• High Fidelity: Austin• Home Theater Store: Arlington, Austin, Houston, Dallas• Krystal Clear: Dallas• Marvin Electronics: Ft. Worth• Matt Panter Sat. & TV: Waco• Mike Massey, Inc.: Odessa• Sound Quest: El Paso.  
UT- AudioWorks: Salt Lake City• Crazy Bob's: St. George, Cedar City• Ultimate Elect.: Layton, Murray, Orem, Salt Lake City.  
VA- Myer-Emco: Falls Church, Tyson's Corner, Fairfax• Audio Connection: Virginia Beach• Audiotronics: Roanoke• Home Media Store: Richmond.  
WA- Bunch-Finnegan TV: Kennewick• Magnolia HiFi: Seattle & Suburbs, Tacoma, Silverdale, Spokane• Pacific Sight & Sound: Wenatchee.  
WI- Audioworks: Washburn• Flanner's A/V: Milwaukee• Hi-Fi Heaven: Green Bay• Sound World: Wausau• Team Electronics: Manitowoc.  
Puerto Rico- Precision Audio: San Juan.  
Canada- Advance Electronics: Winnipeg• Air Waves Radio & TV: Mississauga, St. Catharines, Saskatoon• Kik Bay Bloor Radio: Toronto.  
Canadian Sound: Brampton, Ont. • Digital Dynamics: Abbotsford, B.C. • Environment Electronics: Westmount, Que. • Harrison Audio: Peterborough, Ont. • K&W Audio: Calgary • Kebecon: Montreal.  
Linton's Elect.: Newmarket, Ont. • Sound Station: Courtenay, B.C. • Stereo Plus: Ottawa, Ont. • StereoLand: Windsor, Ont.  
Mexico- Contact Grupo Volumen: Mexico City.



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See our dealer list on page 66



Left to right: Samsung Upoar MP3 cell phone, Nakamichi SoundSpace 2 music system, Sharp MiniDV camcorder, Aiwa MP3 CD player, Panasonic DVD-Audio/Video player, RCA Kazoo MP3 player, Creative Labs Nomad Jukebox with Cambridge SoundWorks PlayDock powered speaker, and iRock MP3 karaoke player (Casio wrist camera shown on page 71, JVC backpack boombox on page 72).





# SUMMERTIME COOL

Cool began with jazz — be-bop in particular, which still is cool. In the '60s, it meant stuff like bell-bottoms — which aren't cool anymore, unless a girl's wearing them. A guy wearing them as a joke *could* be cool, I guess, but the lines are kind of fuzzy there. Afros definitely aren't cool anymore, at least not on white guys — or at least not at the moment. (But hey, you never know.) Pat Sajak never was cool — never will be.

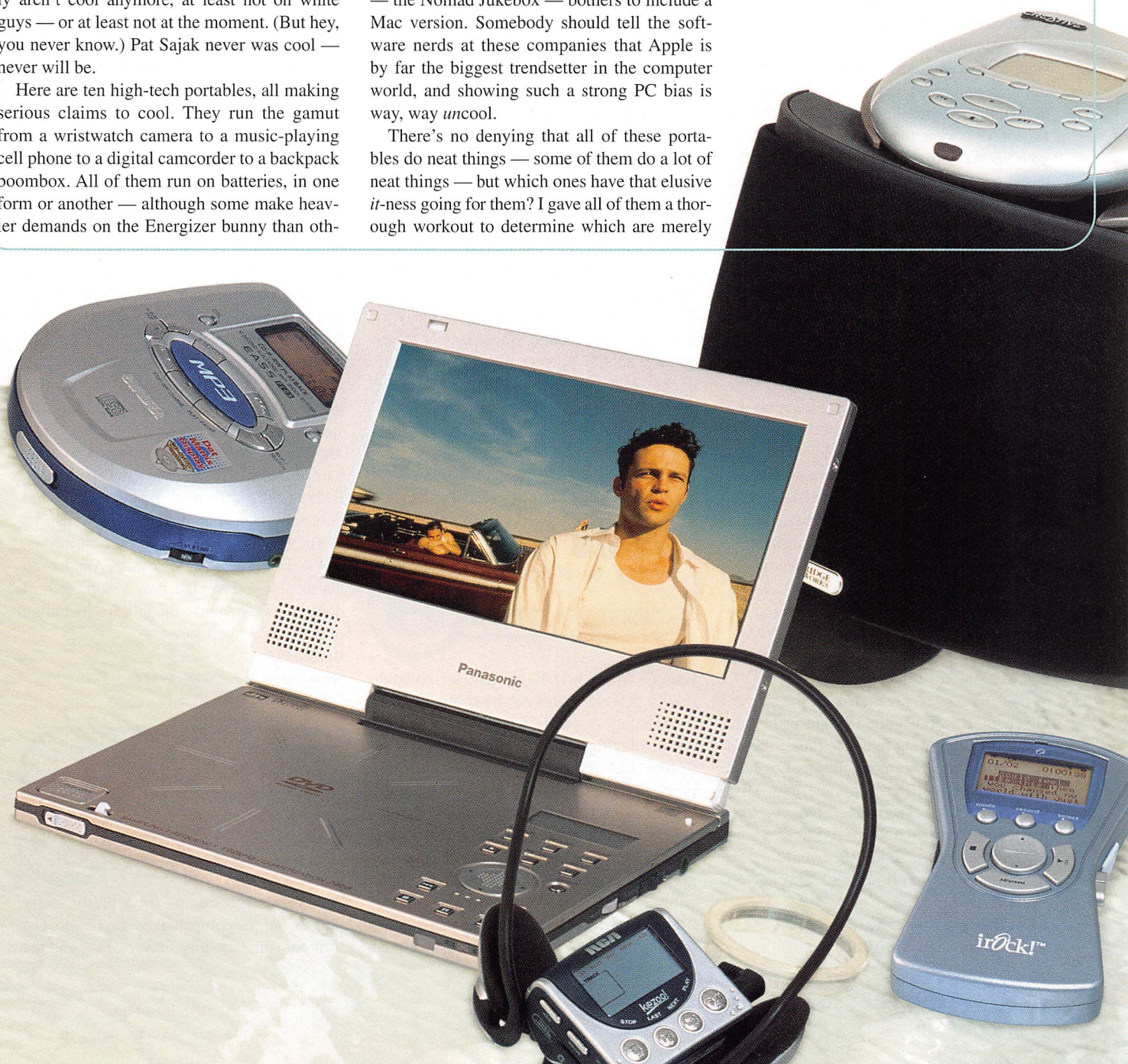
Here are ten high-tech portables, all making serious claims to cool. They run the gamut from a wristwatch camera to a music-playing cell phone to a digital camcorder to a backpack boombox. All of them run on batteries, in one form or another — although some make heavier demands on the Energizer bunny than oth-

ers — and all but the smallest ones come with AC adapters.

Six of the ten do MP3 playback, six have USB ports or facilities for some kind of computer connection, and four use tiny memory cards. One major bummer: of the seven devices that can use or require software, only one — the Nomad Jukebox — bothers to include a Mac version. Somebody should tell the software nerds at these companies that Apple is by far the biggest trendsetter in the computer world, and showing such a strong PC bias is way, way *uncool*.

There's no denying that all of these portables do neat things — some of them do a lot of neat things — but which ones have that elusive *it*-ness going for them? I gave all of them a thorough workout to determine which are merely

**10 high-tech portables  
let the good times roll**  
by Jeffrey Spaulding





functional and which are truly inspired, but my judgments are just general guidelines for cool. The only way to really know is to check the best ones out for yourself.



I've saved the smallest for first. At 2 inches wide, a little under 2 inches high, and just over 1 inch deep, the Kazoo RD1000 (\$150) is one of the smallest MP3 players yet. You can let it nestle in the palm of your hand like a newborn chick, strap it to your wrist (the player, not the chick), or attach it to your belt in a clear plastic pouch.

Also included is a CD-ROM, with software for ripping, downloading, and managing files, and backphones. (Backphones, for the uninitiated, are the same as headphones except you wear them across the back of your neck.) With a tiny player, you'd expect to get tiny earbuds, but the backphones are generously sized and produced decent sound — not the best in this bunch, but not the worst, either. There was some midrange, and even a hint of bass, while the treble wasn't as harsh as it can be on low-quality phones.

For such a small player, the Kazoo's LCD is big and easy to read. But there's a trade-off: ensuring readability means there's room for the track number and bit rate but not the album and artist information you get on the readouts of other MP3 players.

To show it's not just a novelty, the Kazoo does provide some serious storage options, augmenting its 32 megabytes (MB) of resident flash memory with a slot that can hold MultiMediaCards up to 96 MB in capacity. The embedded memory can give you about 45 minutes of music at a low-fi 96 kilobits per second (kbps) or about 30 minutes at the higher-quality 160-kbps rate. Add a 96-MB card, and you get up to 2 hours of playback at the common 128-kbps rate.

Four tracks are preloaded on the player. Given the Kazoo's limited memory, though, you'll probably want to delete those, fire up your PC (Mac users need not apply), load the software, and transfer some new MP3 files to the player. The Kazoo gives you limited control over the sound via four preset EQ curves — Bass, Pop, Rock, and Jazz — but chances are you'll just pick the one you like and leave it there.

**RCA, Thomson Consumer Electronics**  
[www.rca.com](http://www.rca.com), 800-336-1900



The Aiwa XP-MP3C (\$240) is pretty much a standard-issue portable CD player, except that it plays both CD-Rs and CD-RWs as well as MP3 files burned to CD. It took an uncommonly long time to read both these discs and regular CDs, however. And you'll want to get a better set of headphones than the supplied pair — especially if you're going to be listening to lower-bit-rate MP3 files, which can get screechy.

Unlike many flash-memory and hard-disk devices, which give you a playlist on the readout, with the Aiwa you have no choice but to wade through the tracks if a friend sends you an unlabeled CD filled with MP3 songs. This is one area where portable CD players are starting to show their age. The readout will scroll the album and track titles, provided they're part of the MP3 file, but not automatically — you've got to hit the display button to bring it up.

The Aiwa player has a couple of neat extras going for it. It comes with a kit that includes a power line you can plug into your car's cigarette lighter and a cassette adapter that feeds the signal to its sound system. Cassette adapters aren't as useful today as they once were, though, since many new cars come with CD players instead of cassette decks. And you can use the player's AC adapter to juice up its rechargeable batteries.

**Aiwa America**  
[www.aiwa.com](http://www.aiwa.com), 800-289-2492



Casio's WQV1-1CR camera wristwatch (\$200) gets six points on the cool scale just for existing. Anybody who can't get a kick out of playing with this thing is too jaded to live. Just aim the tiny lens on the front, press the shutter button, and you've captured a 120 x 120-pixel black-and-white image on the 1-MB storage chip. (Well — the images aren't so much black and white as gray and shades of khaki, but why quibble with coolness?) Since the camera's operation is absolutely unobtrusive and silent, you'll have no trouble using it to take pic-

tures when you really shouldn't. (You get the feeling with a lot of these portables that the designers watched way too many spy movies when they were kids.)

You're not going to get bright, razor-sharp, high-res photos from this thing — that would be like expecting the Wright brothers to fly you to India — but it's pretty much a dead cinch that the quality of the displays will improve. The lens needs lots of light for good images, so don't even think about doing any dead-of-night stealth photography. (For that use the Sharp camcorder reviewed on page 73.) But it can be hard to make out the display in direct sunlight. You can adjust the brightness of the image before you take the shot, but that doesn't give you tremendous latitude — the range goes pretty quickly from hopelessly murky to completely washed out. You can adjust for outdoor or indoor lighting, though.

The wrist camera's considerable coolness doesn't stop with its picture-taking ability, though. Every time you go to take a shot, the readout lets you know how many images you have room for. You can input up to 24 text characters for each image and use these tags to sort any images you've got stored. (The watch's memory chip holds 100 pictures.) For more way cool spy stuff, just point the front of your watch at the front of another Casio wrist camera, and you can transmit or receive images through an infrared (IR) beam just by selecting Send or Receive on the readout. But that's not all! Buy the PC link kit (\$50), and you get a neat little IR adapter for your computer that looks like a black-plastic cobra. Point the wristwatch at the cobra's head, press Send, and your pictures are transferred to your hard drive, where you can convert them to BMP or JPEG format. You can also send photos from your computer to the watch.

The Casio watch is full of other surprises, too — like it actually tells time. And has an alarm, and you can use it as a stopwatch. It does get one demerit, though, for including only Windows software.

**Casio USA**  
[www.casio.com](http://www.casio.com), 800-962-2746



"Consumer Electronics" is a pretty stuffy phrase, but the companies in the CE biz can turn out some awfully sexy gear — and the



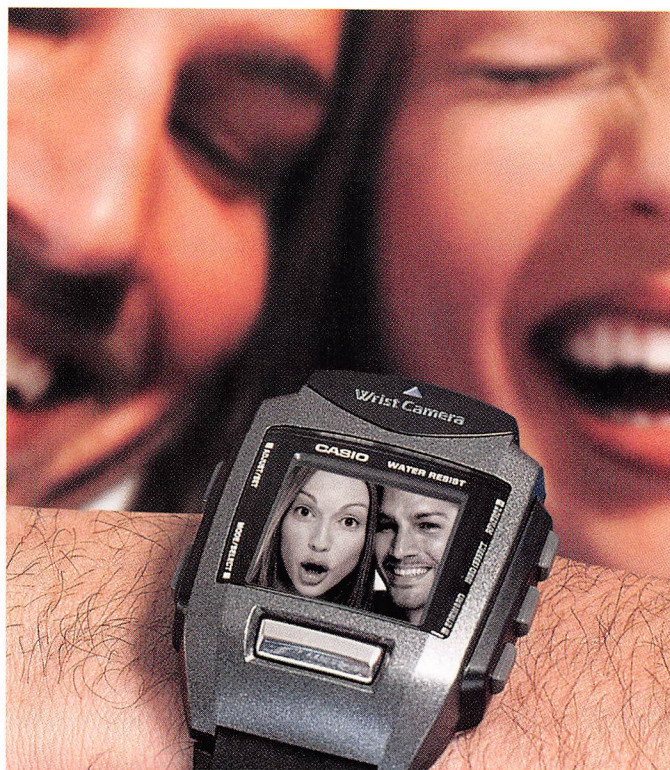
Top 2 drool inducers have to be wall-hanging plasma TVs and portable DVD players. Slim and light, these players fit easily into your briefcase or backpack, or even a really big pocket. Bored on the road, you can whip out the player and watch a flick without having to endure the airline's bastardized version or having a hefty fee tacked onto your hotel bill.

Panasonic's DVD-LA85 PalmTheater (\$1,400) isn't just another portable movie player, though. It holds a 7-inch (diagonal) color widescreen LCD, a Dolby Digital/DTS surround sound decoder, built-in stereo speakers, and a 24-bit/192-kHz digital-to-analog converter for DVD-Audio playback in its ultra-compact 7¼ x 5½ x 1-inch shell. Run a cable from the minijack optical output for surround sound and an S-video cable for video output, and you can use the PalmTheater as the DVD-Video player in your home theater system.

Hooking it up to your system to play the multichannel mix on DVD-Audio discs is more of a challenge. You'll need three cables with a miniplug at one end and two regular RCA connectors at the other to run to the six-channel analog input on your pre-amp/processor or receiver. You can also use an optical digital connection for the front left/right channels and keep the analog connections for the other four channels, but since the music industry has decreed that pristine digital output is a no-no, the digital signal is cut off at 48 kHz.

While the screen is small, I had no problem making out the details of any image in any movie — including widescreen epics. As with any LCD, the viewability falls off rapidly as you move away from the sweet spot, but at that spot the PalmTheater puts out a clean, bright, and reasonably accurate picture. The speakers produce decent enough sound for two tiny drivers built into a plastic case. But you'll probably want to either use the two small stand-alone speakers and 20-watt amp Panasonic includes with the player (not shown in the photo on page 69), or invest in a decent set of headphones (excuse me, *backphones*) for both better sound quality and privacy.

Also included are a rechargeable lithium-ion battery pack and an ultra-thin, lightweight plastic remote with raised-bump buttons. Forget about backlighting or being able to distinguish the different buttons in the dark, but for use on the road, this remote



will do fine. (Besides, you could always program your universal remote to control the player.) The battery pack displayed impressive longevity. Said to be able to hang in there for 5 hours if you keep the screen dim, I was able to get through *Lawrence of Arabia* — overture, intermissions, and all (that is, just under 4 hours) — at normal brightness before the battery finally petered out.

**Panasonic Consumer Electronics**  
[www.panasonic.com](http://www.panasonic.com), 800-222-4213



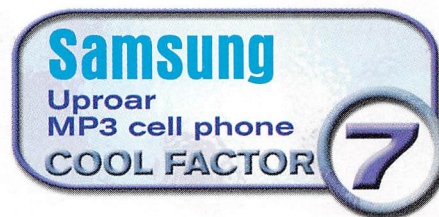
MP3 players are a dime a dozen these days (actually, they're usually \$200 or more a pop, but that's an argument for another time). How many, though, go out of their way to help you sing along with your tunes? Ignoring for the moment whether this is a good thing, if it's something you feel you have to do, the iRock 680 (\$230) will help you get it done. Aside from standard MP3 features like a memory-card slot (two 32-MB MultiMediaCards are included), a USB port (cable included), earbuds, and a built-in belt clip, the iRock has features that take karaoke places it's never gone before. For instance, you can use the built-in microphone to record yourself singing along with a tune. Once you've made the recording, it stays

wedded to the song unless you transfer the file to a PC, go into Windows Explorer, locate the .fid file, and delete it. (Chances are you'll be doing posterity a favor.) When you use files encoded in the MP3K format (yes, the K is for karaoke), the lyrics are displayed on the readout, with each word highlighted as it's sung on the track. (You'll find a decent number of MP3K files at the MP3Karaoke.com site.) Plug another set of phones or buds into the second jack atop the player, and a friend can croon along, too.

You can also use the voice-recorder feature for plain, old, boring stuff like note-taking. The sound quality through the microphone was pretty good — and, unfortunately, encourages you to sing along louder than you really should. The playback sound wasn't great, though, even after I swapped out the buds for better phones.

The iRock also has an FM tuner. Indoors, I was able to bring in just enough stations to fill the player's five presets (only two stations were locked in strongly). Outside, I did a little better, but this is *not* a cracker-jack tuner. Careful, though — you can doom even this minimal reception if you plug the buds into the lefthand jack atop the player instead of the right one. The readout gives nice, big numbers for radio stations but uses pretty small characters for other stuff, which can be tough to read in bright light.

**First International Digital**  
[www.myirock.com](http://www.myirock.com), 847-202-1900



The Uproar SPH-M100 (\$400) is first and foremost a cell phone, and it comes with all of the usual cell-phone goodies, like a digital phone book, a personal information manager, and voice recording. But transfer some files into its 64-MB memory chip via the USB port, and it becomes one of the first phones that can also play MP3 files.

Nobody's going to buy this just for the MP3 player (at least you'd hope not — and anyone who'd pay \$400 for a fixed-memory MP3 player deserves to be taken at every



opportunity), but as an accessory to the latest cultural plague, it's not such a bad deal. You can operate the player with the buttons on the phone (although that gets inconvenient) or with a wired remote, about the size of a silver dollar, that clips to your belt or pocket. The earbuds are attached to the remote. The player's sound through the buds was surprisingly good — better than the two dedicated MP3 players here.

Since the Uproar doesn't have a memory-card slot, there's nowhere to go once you've used up the embedded memory. But you'll be able to store a decent amount of music — about 65 minutes at 128 kbps — before it fills up, and you can always swap those files out for more using the supplied (PC only) MusicMatch Jukebox Plus software.

**Samsung Electronics America**  
[www.samsung.com](http://www.samsung.com), 201-229-4000



No point in pulling punches: the Nomad Jukebox C and the Panasonic DVD player are by far the coolest things here, which is why they both rate a big 10. The Jukebox is a class act all the way around. It looks good, feels good, sounds good, and is a real blast to just goof around with. At \$270, it doesn't cost an arm and a leg, and in the overpriced

world of convergence toys, it's a steal. (Creative Labs expects to have a smaller, higher-capacity version of the Jukebox available by this fall.)

The design is a real eyecatcher — nice, trendy curves, but nothing ridiculously bulbous. And the curves are functional, too, letting the Nomad rest securely in your hand. The buttons are nicely laid out and feel reassuringly firm. The backlit LCD crams a lot of information into its 2½ x 1½-inch space — which means it can sometimes be tough to make out the small characters in direct sunlight. The impressively solid construction lets you know that the 6-gigabyte (GB) hard drive is well protected, but the player still weighs in at less than a pound.

That hard drive is the Nomad's biggest selling point. Preloaded with 20 hours of music, it can hold up to 150 CDs. Patch it into your PC or Mac via the USB port (cable included), and you can download files or rip CDs to the hard drive to your heart's content. (Using the line-in jack, you can also record from analog sources like your cassette deck or a microphone.) You'd have a tough time finding another portable better suited for party play since the Nomad lets you take a good chunk of your music collection with you — no hunting for and swapping out CDs or cassettes, or taking potluck off the radio. Sure, a full-blown rig offers the advantage of bigger sound, but that's about it. (Plug the Nomad into that rig and you've got the best of both worlds.) The hard drive does have one downside: it can be noisy, making it sound like you've got crickets —

but that's not a problem if you're outside and you *do* have crickets, or are standing more than a few feet away.

Wed the Jukebox to the equally solid and well-designed Cambridge SoundWorks PlayDock PD200 portable powered speaker (\$200), and you've got pretty much the perfect party system. Hook up the PlayDock to the Nomad, place the player in the cradle on top, and you've got three drivers and 30 watts of power in a compact, 11 x 11-inch tabletop package. The PlayDock has a full, open sound, with nice stereo separation and ready-to-boogie-down bass. The sound is a little exaggerated, but it's been tweaked to hold its own at a party or picnic, not to feed your critical-listening jones.

The Nomad has two line-out jacks so you can hook it up to other audio systems and includes a USB cable and a CD-ROM with Creative Labs' PlayCenter 2 for PCs and SoundJam MP for Macs (I told you these guys know what they're doing) along with a useful Jukebox tutorial. For \$50 you can get an accessory pack that includes decent headphones, a carrying case, a cassette adapter, and four rechargeable AA batteries.

**Creative Labs**  
[www.creative.com](http://www.creative.com), 800-998-1000  
**Cambridge SoundWorks**  
[www.hifi.com](http://www.hifi.com), 800-367-4434



**JVC's backpack boombox includes a CD player, cassette deck, and AM/FM tuner**



And now — from the sublime to the kind of ridiculous. The JVC RS-WP1 backpack boombox (\$220) is so outrageously dorky that it's almost sort of kind of cool. Looking like an atomic-powered Batman gizmo, a prehistoric bug, or some kind of anime escutcheon, it's actually a pretty traditional boombox all done up in a contemporary shell.

A footstand pulls out from the bottom of the back, letting you rest the pack on a table, where you can admire it as an objet d'kitsch. This is the only way that the owner/carrier/victim can really hear what this thing sounds like. When you're hauling it on your



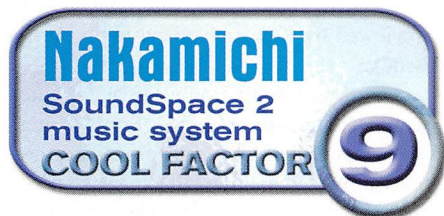
back, most of the sound gets projected behind you, forcing others to eat your sonic dust — which is the whole point, I guess. (The sound actually isn't too bad, by the way. Hardly high fidelity, but better than your average boombox.)

And man, is this thing *heavy* — not as in '70s funkspeak, but as in, a ton to lug around. Adding the eight D-cell batteries necessary for true portability gives you a load that's not for the physically unfit.

The CD player and tape deck performed their jobs well. And the first-rate AM/FM tuner pulled in a decent number of stations with a nice, clean signal — but that means extending the collapsible antenna, which, when you have the pack on, makes you look more like Maxwell Smart than James Bond.

JVC of America

[www.jvc.com](http://www.jvc.com), 800-252-5722



Bose made boring old table radios sexy. By including a portable digital audio player with its SoundSpace 2 (\$750), Nakamichi makes them cutting-edge as well. Lightweight but still substantial, the system uses aqua and sienna accents to relieve the case's gray and silver tones. The main unit has got the curve thing going for it, like the Nomad Jukebox, and at 9 x 7 x 1½ inches, it's nicely compact, too. The top flips open to reveal stereo speakers, a digital readout, and two rows of small but easy-to-work controls.

The digital audio player, which sits cradled in a charger attached to the main unit, resembles an old-fashioned electric razor or a laser gun from a '60s sci-fi movie — in other words, cool in a very retro way. The player's display swivels up to match the angle of the main-unit readout, which makes it easy to check both readouts while you're lying in bed. You get all the information you'll need about the files you've downloaded to the player's 64-MB SmartMedia card, including playing time, track number, track name, encoding format, and bit rate.

The SoundSpace 2 also comes with an AC adapter and a small, podlike remote control that rests nicely in the palm of your hand. A CD-ROM includes Siren Jukebox PC software for creating Windows Media Audio (WMA) files and utility software for formatting the SmartMedia card and downloading and managing files, which you then

transfer to the player via the supplied USB cable.

This *is* a table radio, so don't expect to rock out to it. That said, the sound was pretty open and detailed for such tiny speakers. Bass? Forget about it. But the 3-inch driver on the bottom of the main unit produced a solid lower midrange that will give you a bassy enough effect for late-night listening.

There's a collapsible FM antenna completely concealed within the case. Pull it out by the tip, swivel it up in the air, and you're ready to call your double agent in Moscow. The tuner pulled in about as many stations as the one in my much more expensive preamp, but it wasn't always able to lock them in.

The digital audio player plays both MP3 and WMA files, and its sound, whether through the main speakers or the supplied earbuds, was very good. And, like the iRock, you can use it as a voice recorder by talking into the tiny microphone in the base.

Nakamichi America

[www.nakamichi.com](http://www.nakamichi.com), 310-631-2122



You wouldn't think it would be possible to cram professional-quality video recording and a wealth of high-tech features into a 7¼ x 4¾ x 3¾-inch case weighing less than 2 pounds, but it is. Sharp's VL-WD650U ViewCam (\$1,050) lets you record in the digital MiniDV format — and thanks to the digital connection, you can hook it up to a computer or another camera for editing with as well. Its Zoom microphone works in coordination with the lens to pick up the sounds of whatever you're zooming in on. Slip in the supplied 8-MB SmartMedia card, and you can record stills, which you can then manipulate on your PC using the supplied PixLab software. Flip the LCD viewscreen 180°, and you can stand in front of the camera and see your own mug while taping. Closing the viewscreen brings the more traditional viewfinder atop the camera to life.

Along with the high-tech stuff, the ViewCam has pretty much all the standard camcorder features, like a rechargeable battery



pack, VCR playback functions, effects like fades and dissolves, and digital image stabilization. There are also digital zoom settings to augment the optical zoom.

It might not be the most useful thing in the world, but I had a lot of fun with the Super Cat's Eye night-photography feature, which lets you shoot video footage or stills in no light at all. The possibilities are endless — and dangerous. If the images are murky, you can switch on an IR light that illuminates everything for 10 feet around, but with no one the wiser, giving your footage a whacked-out, *Wolfen* kind of look.

This camera doesn't have the best build quality I've come across, and the unnecessarily complicated loading drawer takes a while to open, receive the tape, and then close. It takes four steps to access on-the-fly features like manual focus, shutter speed, and exposure, but with many camcorders, you only have to hit a button to toggle one of these features on and off. And the various warning sounds jingle and ding like a Vegas slot machine, so when you really screw up it sounds like you've hit the jackpot.

That said, this is still a pretty complete little package that produces both first-rate video and first-rate sound.

Sharp Electronics

[www.sharp-usa.com](http://www.sharp-usa.com), 800-237-4277

I came out of this little roundup feeling seriously converged. It's mind-boggling what they can get into smaller and smaller packages these days. All of this gear (well, with one obvious exception) is more portable than you would have thought possible a few years ago. And almost all of it will keep you amazed as well as amused. I don't think you could ask for a more able or entertaining bunch of companions for your summertime fun.

S&V





# SUPER AUDIO CD

**P**erfect sound forever. Well, some people will tell you that the compact disc doesn't offer either. Diehard audiophiles complained from the day the CD was first introduced that it sounded cold, metallic, and sterile compared with the LP. And the discs can deteriorate over time, if ever so slowly. While years of refinement have led to a marked improvement in overall sound quality, the complaints have never really gone away.

The LP-hugging golden ears weren't the only ones who felt the CD fell short of the ultimate in sonic reproduction, though. Convinced they could do better, CD co-developers Sony and Philips went back to the drawing board to create a format that would address audiophile concerns. And the Super Audio CD was born.

Offering higher resolution than the original CD, compatibility with existing CD gear, and both stereo and multichannel playback, this next-generation compact disc has the potential to lure people away from downloads and other lower-fidelity, on-the-run playback options and back to dedicated music listening on high-quality systems. But the difficult task of establishing the Super Audio CD (SACD) as the CD's successor has only just begun.

## What Lies Beneath

To understand SACD, you have to know something about the Direct Stream Digital (DSD) technology that forms its foundation (see "Inside Super Audio CD" on page 77). Judging that pulse-code modulation (PCM), which has faithfully served the CD for almost 20 years and is the basis for both DVD-Video and DVD-Audio, had reached its limits, Sony and Philips devised DSD to offer both greater dynamic range and more extended frequency response than CD-standard PCM, while also allowing for future development. In fact, much of the early effort to promote SACD has been more of an effort to promote DSD — to

encourage record producers and recording studios to chuck their analog and PCM digital gear and embrace DSD instead.

There are three key things you should know about DSD: First, "direct stream" means, at least in theory, that the bitstream can flow directly from the initial encoding of the analog source through the recording process, onto the disc, and through play-

## SACD goes from two to six channels — and head to head with DVD-Audio

back without using the filters necessary for PCM recording and playback. Second, some producers and engineers feel that DSD recordings have an "analog" warmth and presence that were lost in the transition from LP to CD (see "Back to Analog," page 79). And third, any opinions on DSD and SACD should be taken with a grain of salt. No independent, double-blind listening tests have been done to compare DSD recordings with analog or PCM recordings of the same material.

## Two Will Get You Six

Because Sony and Philips have spent most of the two years since they launched SACD actively courting the high end, which pooh-poohs anything beyond two channels as hopelessly gauche, very little attention has been given to SACD's multichannel capa-

bility. The early releases were all two-channel audiophile chestnuts, primarily from the Columbia/Sony Music catalog. A few surround titles appeared from smaller labels late last year, but the only sop thrown in the direction of the mainstream was the Virgin U.K. reissue of the original quad mix of Mike Oldfield's classic *Tubular Bells* (reviewed by Ken Richardson in the April issue).

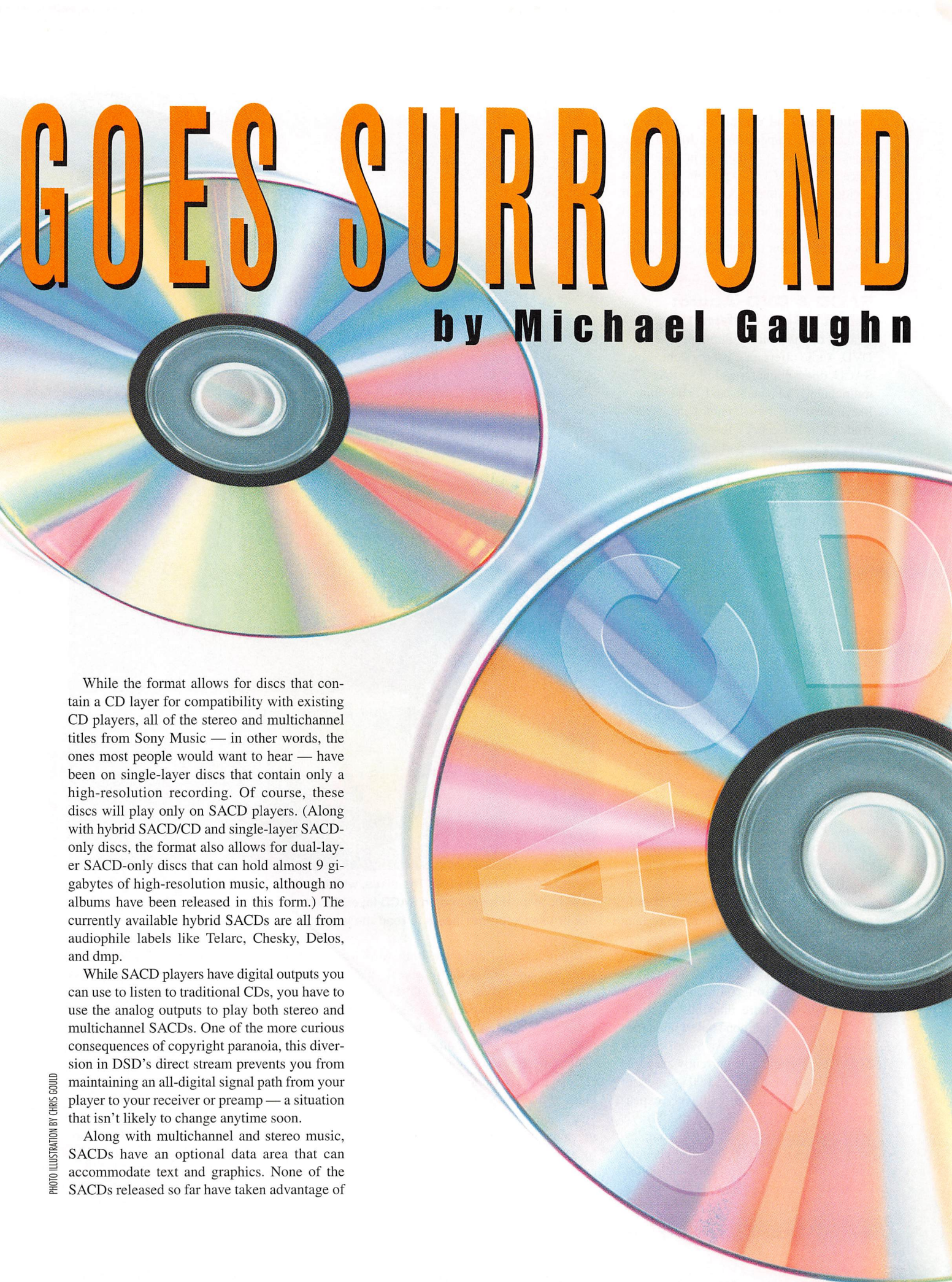
And to ensure that only the audio elite would sample their wares, Sony, along with a handful of high-end companies, initially produced nothing but expensive two-channel-only players. (We reviewed Sony's \$5,000 audio-only two-channel SCD-1 in September 1999, its \$1,500 two-channel DVP-S9000ES SACD/DVD-Video player in January 2001, and the first multichannel model — the \$2,000 Philips SACD 1000 SACD/DVD-Video player — in April.) This strategy appears to have paid off, since the audiophile press has fallen in lockstep behind the format.

But Sony recently announced some inexpensive multichannel players, including two SACD/DVD-Video players as part of its home-theater-in-a-box Dream System line and three SACD/CD five-disc changers. In all, it plans to have more than a dozen SACD products out by year's end. (See the table on page 78 for a list of available and announced multichannel players. Ken Pohlmann reviews Sony's SCD-CE775 SACD/CD changer on page 39.) And Sony Music has come out with a handful of multichannel titles with the mainstream in mind, including James Taylor's *Hourglass* (reviewed on page 108), Miles Davis's seminal *Kind of Blue*, Billy Joel's *The Stranger* and *52nd Street*, a Mozart album by Midori (reviewed on page 108), Celine Dion's *All the Way*, Jeff Beck's *Blow by Blow*, Earth, Wind & Fire's *Gratitude*, and the *Titanic* soundtrack. Such Boomer classics as Meat Loaf's *Bat Out of Hell*, Michael Jackson's *Thriller*, and Boston's first album are rumored to be among the early releases.



# GOES SURROUND

by Michael Gaughn

Two compact discs are shown overlapping. The top disc is partially visible, showing its center hole and a rainbow-like reflection. The bottom disc is more prominent, also showing its center hole and rainbow-like reflection. The letters 'SACD' are embossed on the surface of the bottom disc in a large, stylized font.

While the format allows for discs that contain a CD layer for compatibility with existing CD players, all of the stereo and multichannel titles from Sony Music — in other words, the ones most people would want to hear — have been on single-layer discs that contain only a high-resolution recording. Of course, these discs will play only on SACD players. (Along with hybrid SACD/CD and single-layer SACD-only discs, the format also allows for dual-layer SACD-only discs that can hold almost 9 gigabytes of high-resolution music, although no albums have been released in this form.) The currently available hybrid SACDs are all from audiophile labels like Telarc, Chesky, Delos, and dmp.

While SACD players have digital outputs you can use to listen to traditional CDs, you have to use the analog outputs to play both stereo and multichannel SACDs. One of the more curious consequences of copyright paranoia, this diversion in DSD's direct stream prevents you from maintaining an all-digital signal path from your player to your receiver or preamp — a situation that isn't likely to change anytime soon.

Along with multichannel and stereo music, SACDs have an optional data area that can accommodate text and graphics. None of the SACDs released so far have taken advantage of



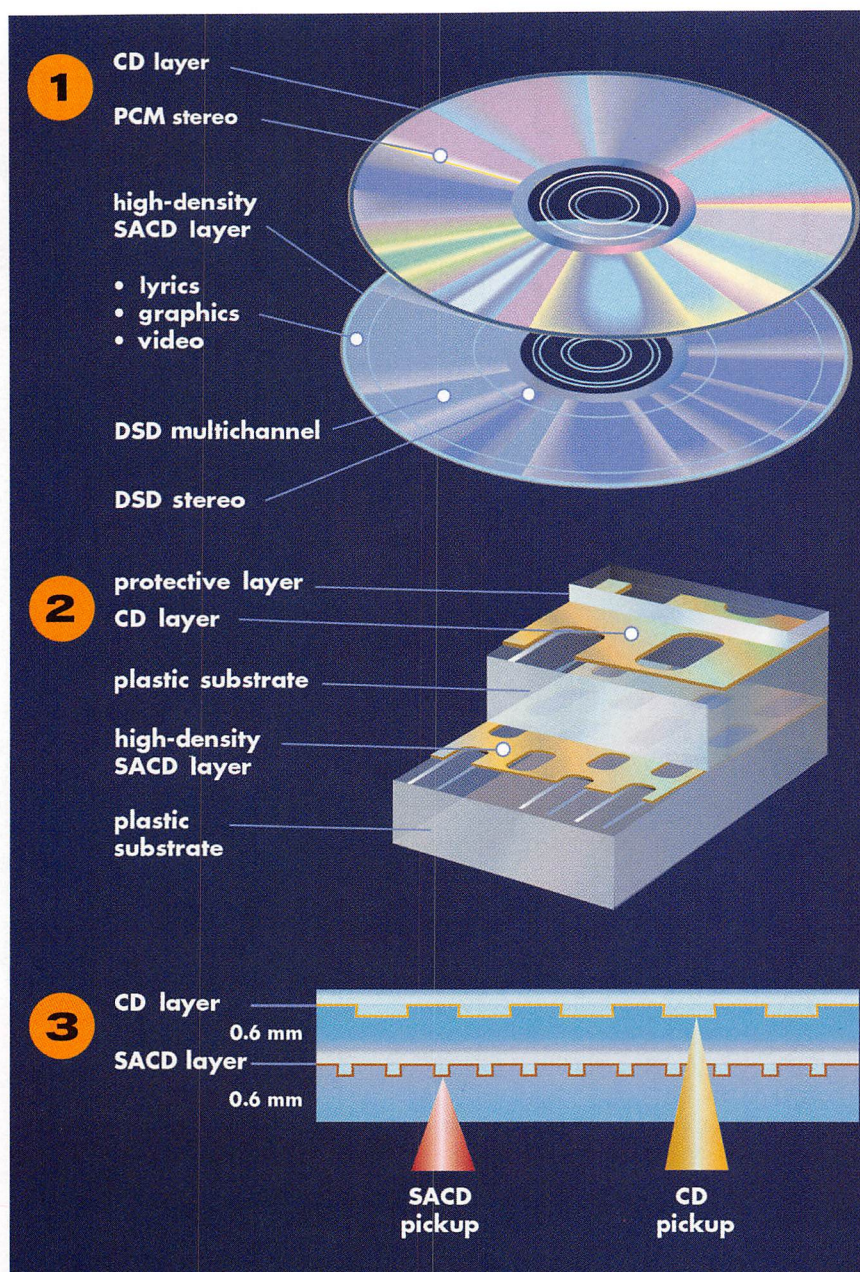
this capability (presumably to avoid offending high-end sensibilities), and none of the labels supporting the format have plans to use it — which is just as well, since Sony's SACD/CD players don't have a video output that would let you watch the extra content anyway. Most SACDs do display the disc's title, artist name, and track information on the player's readout, however.

## SACD & DVD-Audio: What's the Difference?

If a lot of this sounds familiar, it should. DVD-Audio offers many of the same things SACD does: higher resolution than CD, multichannel playback, and extra content like liner notes, lyrics, photos, and video. And what differences there are between them are for the most part subtle.

The most obvious difference is that, like its DVD-Video cousin, DVD-Audio relies on PCM technology, while SACD uses DSD. Whether this leads to significantly better sound has yet to be determined. You'll hear people from both camps shouting that the other format doesn't have what it takes to succeed the CD, that its higher resolution doesn't go high enough. Some will even tell you that the other format is fatally flawed. Since both SACD and DVD-Audio have the potential to offer spectacular multichannel sound, though, you're best off ignoring the more rabid orators, listening to the discs for yourself, and making up your own mind. You'll be as far ahead as anyone else in the debate.

The other obvious difference between SACD and DVD-Audio has to do with commerce, not technology. Kenwood, Panasonic, Pioneer, JVC, Onkyo/Integra, Konka, Toshiba, and Yamaha offer DVD-Audio players, which are available at prices ranging from a couple hundred dollars to \$6,000, and models from Denon, Meridian, Harman Kardon, Rotel, and Samsung are on the way. Sony, Marantz, Sharp, Accuphase, and Classé make two-channel SACD players, but only Sony and Philips are currently offering multichannel players. (There are more than 50 additional SACD licensees, but none have announced plans to sell players.) At \$400, Sony's SCD-CE775 is the only currently available SACD player for under \$1,000 — most of the other players are prohibitively expensive and two-channel only. But Sony's \$600 and \$800 Dream Systems (complete with speakers), an \$800 five-disc changer, and a \$300 single-disc player — all multichannel — are in the pipeline.



**Hybrid SACDs revealed:** ① The discs, which can play on all existing CD players, have both a CD layer and an SACD layer. ② The disc's structure. ③ How an SACD player uses separate lasers to read the layers.

There's been talk since both formats were first announced of "universal" players capable of DVD-Video, DVD-Audio, SACD, and CD playback. Pioneer's \$5,999 DV-AX10 is the only one of these players that's actually been produced, but it's not really universal since it can play only two-channel SACDs. Budget manufacturer Apex plans to have a \$299 player available by year's end, but don't be surprised if licensing and other issues keep it from appearing by then. Beyond that, no other manufacturer has announced plans to produce such a player.

The first round of DVD-Audio players have been criticized for not including bass management, which allows you to properly route the lower frequencies in a satellite/subwoofer speaker system. All of Sony's multichannel SACD players include bass management, which can be accessed via the front-panel readout.

Both camps have one major headache in common: aside from Sony Music for SACD and Warner Music for DVD-Audio, no other major label has yet released a significant number of discs for either format. Besieged by new technologies like MP3



## INSIDE SUPER AUDIO CD

**A**s names go, Super Audio CD (SACD) is remarkably descriptive. It is almost literally a compact disc with super audio: wider bandwidth, greater dynamic range, and, perhaps most important, more channels — all on a 4¾-inch plastic disc. In addition, an SACD can carry text (disc title, artist names, track titles, lyrics, liner notes, and so forth), graphics, and even video to spice the mix up a bit.

Delivering so much information without compromise requires a lot more data capacity than the old CD-type 650-megabyte disc has to offer, however. So the foundation of SACD is a DVD-style high-density disc that can hold up to 4.7 gigabytes — about six times as much as a regular CD.

Arguably the most interesting technical characteristic of SACD is what actually goes on that high-density disc. An ordinary music CD normally carries two channels of pulse-code-modulated (PCM) digital audio using 16-bit data words and a 44.1-kHz sampling rate. That's good for a dynamic range of about 96 dB and a frequency bandwidth of a little over 20 kHz. An SACD, on the other hand, can carry as many as six channels of audio in a relatively new digital format that Sony and Philips call Direct Stream Digital, or DSD. As recorded on SACDs, it uses 1-bit data words at a ferocious sampling rate of a little over 2.8 MHz. The result is a dynamic range of about 120 dB in the audible range below 20 kHz (approximately equivalent to 20-bit PCM) and an upper frequency limit of about 100 kHz.

The numbers tell only part of the story, however. DSD's primary virtue is simplicity. Direct Stream Digital is an example of what is known generically as delta-sigma or, sometimes, bitstream audio coding. In SACD's DSD, a single bit is toggled on and off very quickly (at that 2.8-MHz rate mentioned earlier). As the amplitude of the signal goes up, the proportion of the time that the bit is toggled on (set to one) also goes up. As the signal goes down, the trend reverses, with off settings (zeros) gaining dominance. The result is a pulse train whose density varies according to signal level — a system known as pulse-density modulation, or PDM. At full positive level, the DSD bitstream is all ones; at full negative level, it is all zeros; and at zero signal level, ones and zeros precisely alternate.

The amount of noise in a 1-bit signal is

inherently rather large, but the high sampling rate distributes it over a very wide frequency range, which improves the signal-to-noise ratio down in the audio band. Performance is further enhanced by aggressive noise shaping that squeezes still more of the noise out of the audible range up into the ultrasonic region (above 20 kHz), where it won't bother us.

Delta-sigma coding is actually used in the front ends of most modern high-quality PCM analog-to-digital (A/D) converters and at the back ends of many PCM digital-to-analog (D/A) converters. In between, however, the bitstream signal must be converted to PCM (decimated) and back (interpolated). These processes are accomplished by digital filters.

DSD effectively cuts out the middle-man. Instead of converting the bitstream signal to PCM, DSD simply records it. Then, on playback, all that's required is what would be the very last stage of a conventional PCM D/A converter: an analog low-pass filter to remove components above the system's 100-kHz upper frequency limit. What emerges is an extremely close replica of the original analog input signal.

DSD pays for its simplicity with relative inefficiency. Compared with PCM, it tends to hog both storage capacity and transmission bandwidth. Sony and Philips have developed a lossless compression system for DSD that makes it possible to fit both six-channel and two-channel versions of a CD-length program onto one SACD, but bit for bit and after compression, PCM is still more efficient. And since all current digital signal-processing (DSP) chips operate on PCM signals, any DSP in the playback chain will require conversion from DSD to PCM, at least in the near term. Besides, none of the players so far supply a digital DSD bitstream for an output.

SACD's last big trick is one of its most appealing. The standard allows for dual-layer discs with a regulation CD recording on the top (nearest the label) and an SACD beneath it. Most ordinary CD players will see only the top layer of a dual-layer SACD release and play it just like an ordinary CD. Put the disc in an SACD player, however, and you'll get the high-resolution DSD version. Given all the car and portable CD players people already have, that's a wonderfully practical transition feature. —Michael Riggs

and peer-to-peer services like Napster, and haunted by visions of a world crawling with music pirates, the other labels might be feeling they have better things to worry about than improved versions of what were pretty convenient formats to begin with. Universal and BMG, for instance, which are part of the DVD-Audio coalition and are known to have already mixed some albums for DVD-Audio release, have since pulled back, shifting their attention to the ultra-compact but untried DataPlay format. True, Sony Music has the hallowed Columbia catalog to draw on, along with the Sony Classical and Epic labels, and Warner Music includes the Warner Bros., Reprise, Atlantic, Elektra, Rhino, Erato, and Teldec labels under its umbrella. But it's hard to see how DVD-Audio and SACD stand a fighting chance in the mass market without the variety and visibility the other heavy-hitting labels can bring.

Caught in the crossfire, smaller labels like DCC Compact Classics and Telarc are hedging their bets by releasing some titles in both formats. Given the current economic climate, they literally can't afford to commit to one side or the other.

Most SACD and DVD-Audio discs have been priced between \$22 and \$25. Sony Music has the most extensive catalog of two-channel titles, including classic recordings by Glenn Gould, Billie Holiday, Miles Davis, Leonard Bernstein, Thelonious Monk, and Bob Dylan as well as more recent albums by Jennifer Lopez, Yo-Yo Ma, Charlotte Church, and Ricky Martin. Sony's first round of multichannel titles should hit right around the time you read this. With its six-month head start, DVD-Audio has put together a more extensive and eclectic multichannel catalog, including albums by Metallica, Steely Dan, Stone Temple Pilots, Zubin Mehta, Natalie Merchant, Deep Purple, Ry Cooder, Take 6, the Corrs, and Blue Man Group.

Another important difference between SACD and DVD-Audio has to do with the playback options you can expect when you buy a disc. Hybrid SACDs can play in both SACD and CD players, while the nonhybrid discs play only in SACD players. But you need a *multichannel* SACD player to listen to the surround mix, even with a hybrid disc. You don't need a dedicated DVD-Audio player, however, to hear the multichannel mix on a DVD-Audio disc. All of the titles released so far include a Dolby Digital version of the surround mix, and sometimes even a DTS version, so you can listen to it on a DVD-Video



player as well. DVD-Audio discs won't play on CD players, however.

While it's been frequently cited as one of SACD's big advantages over DVD-Audio, the format's compatibility with existing CD gear might not be everything it's cracked up to be. Hybrid discs were meant to avoid making record stores carry dual inventories, but Sony has so far avoided hybrid releases precisely because it doesn't

memory devices, game systems, hard-disk audio and video recorders, and a whole slew of other gadgets and services for limited home-entertainment dollars, and that higher resolution is the last thing on most people's minds, you'd think it would make sense for both sides to somehow pool their resources to give high-resolution multichannel playback its best shot in the marketplace. But therein lies the rub.

## The obsession with resolution could mean that both SACD and DVD-Audio will end up as nothing more than audiophile formats.

want to compete with its existing CD catalog. And at around \$25 a pop, titles that are available only on hybrid discs force people who only want the CD version to pay a premium.

One final difference: SACDs lack the navigation menus you'll find on DVDs. This might not be a big deal for hard-core audiophiles, but as more and more home-entertainment components and services come to rely on the TV screen for access and navigation, not having menus could come to seem as quaint as manually cueing up an LP seems today.

### United We Stand . . .

Given that Sony Music and Warner Music don't have strong support from any other major labels, that SACD and DVD-Audio have to compete with MP3, cable and satellite TV, the Web, DVD-Video, flash-

There are a lot of reasons why DVD-Audio and SACD just can't get along. Maybe the most significant is that the DVD-Audio camp truly feels its product is a significant improvement over both the CD and DVD-Video for music reproduction, while the SACD camp feels just as strongly that its product is even better than DVD-Audio. Money has a lot to do with it, too. As developers of the SACD, Sony and Philips stand to make a lot more from that format than they do as part of the large consortium behind DVD-Audio.

Both formats offer something for everyone — but not if you dwell on higher resolution. Most people don't listen to music under the critical conditions that would allow them to hear whatever differences might exist. And that's where SACD's strategy of courting the high end could come back to haunt it. The opinions of the audio

gurus are one thing, but people are going to want to hear the sonic benefits of SACD for themselves before they invest in new gear and spend an average of \$10 more per disc — and replace discs that are already part of their collections.

Convenience plays a key role in the success of any format. For most people, better sound, when excellent sound already exists, is gravy. Multichannel is the big drawing card for both formats, and it will come down to who offers the most creative mixes of the most intriguing titles from the biggest artists. Extras will help to draw people in, but it will be the total experience that will win them over.

The obsession with resolution, coupled with the limited catalogs, could mean that both SACD and DVD-Audio will end up as nothing more than audiophile and enthusiast formats. But do they deserve that fate? If enough inexpensive DVD-Audio/Video players appear, DVD-Audio could ride its video brother's coattails indefinitely without ever becoming a huge success. And SACD could hang in there by catering to the audio elite. A broad offering of affordable universal players would up the ante a bit, but it still wouldn't eliminate the problem of quadruple inventories at the record store, where you'd have to wade through the CD, DVD-Audio, DTS CD, and SACD offerings in the music bins. Given the limited shelf space, store owners will be reluctant to free up the room to accommodate the expanding catalogs of multichannel releases.

The more difficult the two camps make things — with dedicated rather than universal players, splintered inventories, and confusing messages — the less likely it will be that either format will succeed in a big way. This is the first opportunity in a long time to get people interested again in listening seriously to music, and it could very well be squandered.

But even this multinational storm cloud could have a silver lining. Both Sony and Philips are members of the group that came up with the DVD-Audio specifications, and those specifications allow for DSD recordings to be included on DVD-Audio discs as an option, in much the same way DTS is an option with DVD-Video. While there are no indications that either Sony Music or any other record label is even considering this course, let alone taking the first steps to implement it, it is an option — one that would solve a lot of the problems dogging both formats and give high-resolution multichannel audio a fighting chance. **S&V**

### MULTICHANNEL SACD PLAYERS

#### Marantz

SA12-S1	\$3,800	single-disc player; plays DVD-Video
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#### Philips

SACD 1000	\$1,999	single-disc player; plays DVD-Video
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#### Sony

SCD-C555ES	\$1,700	five-disc changer
SCD-C222ES	\$800	five-disc changer; available in September
DAV-C700	\$799	DVD Dream System includes satellite speakers, subwoofer; plays DVD-Video; available in July
DAV-S500	\$599	as DAV-C700
SCD-CE775	\$399	five-disc changer (reviewed on page 39)
SCD-XE670	\$399	single-disc player; available in September



# Back to Analog

Producers, engineers, and record-label execs  
sound off on SACD's promise

by Doug Newcomb

As the tug of war to become the preeminent audio format intensifies between Super Audio CD and DVD-Audio, a covert struggle is underway to win the hearts, minds, and ears of the people who bring the music to each shiny disc. This campaign isn't being aimed at musicians but at the producers, engineers, and others behind the scenes who make crucial decisions on how to present an artist's work, from original recording to mixing to mastering and disc authoring. Before either camp can even hope to win a place in

**I think SACD is a superior system to DVD-Audio — it just sounds much better.**

**Larry Klein**

the homes of music lovers worldwide, they have to ensure that these largely below-the-radar craftsmen support their recording technology.

In the case of SACD, that technology is known as Direct Stream Digital, or DSD (see "Inside Super Audio CD," page 77). DSD was designed to improve on pulse-code modulated (PCM) digital audio, which has been the standard for digital music since the advent of the CD in the early '80s and is still used for DVD-Audio.

The people who produce the music best suited for such high-resolution formats are constantly seeking ways to bridge the gap between what goes into the microphones in the studio or concert hall and what ultimately gets mixed down to the discs you pop into your player. Besides making high-quality digital recordings,



DSD encoding is touted by developers Sony and Philips as ensuring "remarkable closeness to the analog source" when the original recording is on analog tape, which many top producers still use. Ironically, Direct Stream Digital especially appeals to

recording-industry veterans who reluctantly accepted digital audio when it appeared a couple of decades ago.

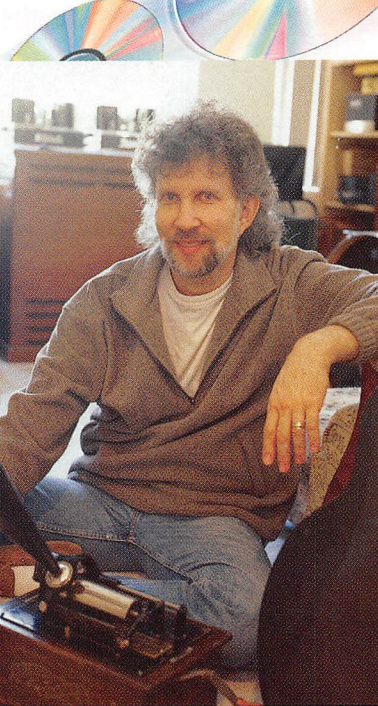
Two years into SACD's launch — and at a critical juncture in its rivalry with DVD-Audio — I asked several recording professionals to comment on the sound quality of the two formats. As in any domestic dispute, there's merit on both sides, and most of the recording industry's movers and shakers have yet to make a choice between them. In fact, many engineers and producers like both and hope they can somehow co-exist. And almost everyone worries that the impending format war and the inevitable confusion it will create could turn the public off. At a time when millions of people seem happy with mediocre-sounding music downloads, proponents of both SACD and DVD-Audio fear that these formats could go the way of "quad," the ill-fated '70s surround format that the buying public roundly rejected.

By the way, you should keep in mind as you read what follows that the multibit DSD encoding process performed by studio equipment isn't the same as the 1-bit DSD encoding that ends up on SACD pressings. Most of the comments here refer to *studio* DSD sound.

## **Both Sides . . . But Not Now**

A preference for one high-resolution format doesn't necessarily translate into unwavering allegiance. Producer Larry Klein, for example — known for his work with Joni Mitchell (his wife during the '80s), Shawn Colvin, and others — prepared mixes of Mitchell's 2000 recording *Both Sides Now* for both DVD-Audio and SACD. The Grammy-winning CD,





**SACD is the best-sounding digital audio I've heard. It makes everything much more lifelike.**

**Steve Hoffman**

JOHN SKALICKY

with backing by members of the London Symphony Orchestra, is in many ways perfect fare for a high-resolution, multichannel format. In fact, Warner Bros. released the DVD-Audio version in April (see review on page 110). Klein, however, told me he unequivocally prefers the sound of SACD. "I was absolutely blown away by the difference. I think SACD is a superior system — it just sounds much better.

"But I still love the sound of analog tape," he added. "So what I was struck by in comparing the formats was that DVD-Audio has the same kind of crunchy sound on the high end that CDs have, which always bothers me. Listening to SACD," Klein recalled, "was the first time I've thought, 'Wow, that retains the warmth and sonic cohesiveness of analog tape.' I was really excited when I heard it."

Several other veteran producers echoed Klein's comments about the analog-like character of SACD. "The sound quality [of DSD recording] is by leaps and bounds the best I've ever heard from a digital format," declared Joe Harley, an independent producer and former president of the audiophile label AudioQuest. "I've had a lot of opportunities to make comparisons between a DSD recording and two-track analog tape recording. And going back and forth between the direct microphone feed, the DSD recording, and the tape, in many

cases I couldn't hear the difference between the DSD recording and the direct feed. It doesn't get better than that."

Another longtime analog devotee who has become a DSD convert is producer Bruce Swedien, a five-time Grammy winner in the engineering category whose recording career stretches back to the late '50s, when he worked with such jazz greats as Count Basie, Duke Ellington, and Sarah Vaughan.

"To me, digital audio, particularly the lower-resolution formats, has very little depth of field," said Swedien, who was working on Michael Jackson's latest record when we spoke. "And as the dynamic range shrinks, you get less and less resolution, so low-level dynamics become distorted. But I don't hear any of that with Direct Stream Digital. I hear the dynamics exactly as they went in, which, to me, is the bottom line. Music is a very passionate process, and if you can't portray the dynamics and the feeling you're after, you've lost the ballgame."

As the engineer who remastered such landmark LPs as the Eagles' *Hotel California* and Bob Dylan's *Highway 61 Revisited* for DCC Compact Classics — a label that releases audiophile versions of pop, rock, and jazz titles — Steve Hoffman has a different take on DSD. His job is taking classic recordings and making them sound better, but he has mixed feelings about using DSD in this process.

"The analog masters that I've tried to use the DSD mastering gear on have come back to me not sounding exactly the way they sounded when I put them in," Hoffman admitted, "which surprised me. I couldn't get a neutral rendition." He went on to explain, however, that all kinds of variables come into play in a remastering process and that he likes the sound of original DSD recordings.

"If I wanted to make a recording and could choose my medium," he concluded, "it would be SACD. It's the best-sounding digital audio I've ever heard. It just makes everything much more lifelike. But unless Sony helps SACD along, it's going to be strictly an audiophile format."

### **Early Adopter**

One analog aficionado who was quick to embrace DSD recording is the eight-time Grammy winner Steve Epstein, senior executive producer for Sony Classical. Because of his affiliation with Sony, of course, Epstein was in a position to become an early adopter of DSD. His first full DSD re-

cording was Yo-Yo Ma's *Solo*, released in 1999. One of Epstein's most recent DSD projects, *Appalachian Journey* — featuring Ma, Edgar Meyer, and Mark O'Connor, with guests James Taylor and Alison Krauss — won him a 2001 Grammy as Classical Producer of the Year.

"I was very interested in experimenting with DSD," Epstein recalled, "and I asked if we could take the equipment along on one of our sessions to try it out and run it with our conventional 24-bit [PCM] system. We took it on a Yo-Yo Ma recording session at Mechanics Hall in Worcester, Massachusetts, and we ran DSD along with a half-inch analog 30-ips [inches per second] tape machine. We recorded Yo-Yo's performance, and when we got back to the studio we did some comparisons. We had other engineers and another producer come in and listen, and amazingly enough, the DSD recording was on top every time. It was uncanny.

"It's much closer, ironically, to analog audio than has ever before been achieved in digital," Epstein said, "so you're able to hear the nuances of everything recorded. But string instruments, for me, are the most telling when it comes to how accurate the reproduction is. And I have never heard sound that accurate and that natural and that palpable from string instruments recorded on equipment other than DSD. Obviously, some superior recordings are made with 24-bit, 48- or 44.1-kHz [PCM], but this is just an audible notch higher and more refined. For me, it's the state of the art," Epstein concluded.

Tom Jung, owner of the audiophile label Digital Music Products (dmp), is a pioneer in digital recording who established his company and reputation using PCM technology. Now, however, he's turning his back on it for DSD.

"I started recording PCM digital in the late '70s, before the CD was around," Jung explained. "I kind of embraced PCM for its good qualities, but the more I worked with it, the more I realized its shortcomings. We went from 16-bit to 18-bit to 20-bit to 24-bit in quest of higher-resolution PCM. But the problems, like brick-wall filtering, remained. I've spent most of my career trying to make PCM sound right, and I finally gave up on it. DSD is closer to what music sounds like in real life, something that PCM digital has never been.

"I'm so bullish about SACD that we're going to discontinue making regular CDs and just make SACDs in the future," Jung declared. "They'll be hybrid SACDs, so



you'll still be able to play them on an ordinary CD player. Granted, we won't sell as many, but I really don't care. We just want to make the best product we can. If the market goes with DVD-Audio instead, I'll just retire and go fishing."

David Chesky, the co-owner of another audiophile label, Chesky Records, takes a more inclusive view. "I don't dictate the market," he observed. "The consumer decides. We're a software company, and since there's consumer demand we put things out in SACD. It's a format people seem to be interested in, as they are in DVD-Audio. Both of these formats are far superior to CD. Both have high resolution and the potential of multichannel, which is better than two-channel. But we still make CDs. And we make cassettes. If there was a demand for 8-track tapes, we'd probably make those, too."

Chesky warned about people declaring too quickly that one format is superior to the other. "If you're going to make a statement about which one's better," he said, "you want to have both playback systems set up in parallel under controlled conditions. Everything has to be the same. You change a wire, it could change the sound. It's irresponsible for people to make comments about either format without doing their homework. And I'm not really qualified to comment on that at this point because I haven't done the experiments. I just don't want to decide on the basis of hocus-pocus or magic."

## A Second Chance

After higher resolution, it's SACD's multichannel potential that most intrigues the professionals I interviewed. "For me, the most exciting thing is the notion of surround SACD," said Steve Epstein. "When you have all the spatial information coming at you, that to me is the last word in reality. We recorded Midori, the violinist, performing Mozart's Sinfonia Concertante for Violin, Viola, and Orchestra. It's the first album I mixed for surround as well as stereo, and it's pretty incredible sounding" (see review on page 108).

**Super Audio CD and DVD-Audio are both superior to CD. I don't want to decide which is better on the basis of hocus-pocus or magic.**

**David Chesky**

**The most exciting thing is surround SACD — that's the last word in reality.**

**Steve Epstein**

In fact, it's a dream come true, Epstein confided. "I've been working for CBS Records — now Sony Classical — for almost 28 years. I started just as quad was in its heyday, and I saw the possibilities. I even mixed an album back in 1974 for surround. But, of course, back then it was a matrixed, nondiscrete system. So [for the Mozart], it was very exciting to do a state-of-the-art surround mix with discrete channels."

Larry Klein said that Joni Mitchell's *Both Sides Now* provided "the perfect opportunity" to try out surround sound recording and mixing. "We knew that the record was probably going to be released in six channels. So we wanted to do whatever we could to make that mix sound incredible. We positioned surround mikes behind the conductor, so that was part of the equation from the very outset. We didn't do any kind of crazy panning or anything like that. We just used the medium to make the listeners feel like they're sitting in a room with this incredible orchestra and listening to Joni singing to them."

Joe Harley produced Robert Lockwood Jr.'s *Delta Crossroads*, which Telarc will release on surround SACD this year. "Here's an 85-year-old bluesman," Harley pointed out, "sitting in a chair in the studio singing and playing guitar, and we're recording this in surround sound DSD. The effect when you play it back in surround is that



he's there in front of you. You're in the room. It's not like he's in your room — you're in *his* room. You can tell you're in a different environment."

EBERT ROBERTS

## State of the Art

People at home, however, *will* be in a much different environment. It's one thing to hear dramatic differences in recordings while working in state-of-the-art studios. But how does this translate to the typical home listening experience, where acoustics and speaker positioning are usually less than ideal and the audio signal chain might not be of the highest quality?

"I think the listener will benefit by experiencing what the producer, the engineer, and the artist had in mind when performing and recording this music as closely as the state of the art now permits," Steve Epstein said. Joe Harley went so far as to predict that, like the CD when it was first introduced, SACD will encourage people to examine their favorite music in a whole new light — and possibly even change the way they listen. "If you have an SACD player — and now the players are really coming down in price, so it's not just exotic stuff for audiophiles — you can play back pretty much what we hear in the studio."

Harley goes on to speculate, though, "that CDs may be one reason people don't view their stereo systems as primary destinations, the way we did years ago. Even played on the best machines, CDs have a kind of antiseptic quality that makes it very easy for people to do other things — do the dishes, read the paper, read a book, whatever. With SACDs, it's hard to do something else. You try to read the paper or whatever, and it's hard to do because there's so much more information coming at you. It draws you into the experience emotionally as much as great analog audio does. It's exciting to have that opportunity again."

S&W

EBERT ROBERTS





# All Systems Are Go!

Our expert recommends home theater systems for people in three radically different situations

**D**o I get letters? You bet I do! Everyone has a question for the Gear Guy. I get letters from people who want to buy high-definition TVs, minisystems, exotic speakers — you name it. I also get lots of eviction notices, subpoenas, and an occasional letter bomb. But that's another story. Our current batch is

from folks with very different needs who are looking to buy complete audio/video systems. To help them out, I've pulled together three distinctly different rigs out of equipment that recently received a big thumbs up from **Sound & Vision's** reviewers. But enough of my gabbing — let's field our first question:

## Dear Gear Guy,

*I'm a professional in my 20s, living in a small studio apartment in the big city. I have a CD boombox and a good 27-inch TV, but that's it. I'd like to get a DVD player and some decent speakers. But I just don't have the room for a full-size home theater, and I don't want to settle for a simple home-theater-in-a-box system. What's a space-challenged yuppie to do?*

**Closet Man**

## Dear Closet Man,

Welcome to life in the big city, pal. It's hard to get full sound in a small space. You need gear that's physically compact but avoids the drastic performance compromises that usually accompany lightweight electronics. The trick is to balance the performance of the different components — you don't want to have one awesome piece of gear that can't show its stuff just because the rest of the system is holding it back. This is particularly tricky with budget systems because there's no margin for error.

Well, for \$1,698 — before discounts — you can get a pretty nice rig. First, I'd rec-

ommend Sharp's \$800 DV-A2000U (reviewed in April), which combines a DVD-Video player with a Dolby Digital receiver that delivers 40 watts to each of its five channels. The disc-loading tray slides right out the front of the receiver. Pop in a movie disc and you're in business. This integration means you don't have to have two separate components with their own power supplies, digital-to-analog (D/A) converters, and so on. And the single chassis takes up less space than two. If your TV can't handle the receiver's component-video output, you can use its S-video output.

The DV-A2000U isn't perfect, however. It lacks a DTS decoder (which won't be an

issue for many people), digital audio inputs, and a six-channel analog audio input for jacking in a DVD-Audio or SACD player. But in his review, the always hard to please David Ranada said he was "perfectly satisfied with the DV-A2000U's sound and picture quality."

For your speakers, I'd recommend the JBL N Series home theater suite (\$898, reviewed in January), which is made up of four identical N24 satellite speakers for the left/right front and surround positions, an N-Center speaker for the center channel, and the PB10 subwoofer. This 5.1-channel system is truly compact, and the ball-swivels on the N24s make them easy to wall-mount — you don't even need shelf space. The satellites blend well with the PB10 subwoofer, which has a 10-inch driver powered by a 150-watt amplifier. Overall, these JBL speakers should crank out more than enough sound for your small room. Daniel Kumin concluded his review by saying, "This JBL system's value for the money is obvious. Getting such well-balanced sound, with notable bass extension and no salient vices, from a package priced just under \$900 is impressive." ➤

• **Sharp DV-A2000U**  
DVD-Video player and  
digital surround receiver  
(\$800)

www.sharp-usa.com,  
800-237-4277

• **JBL N24** satellite speakers,  
**N-Center** speaker, and  
**PB10** subwoofer (\$898)

www.jbl.com, 800-336-4525







### Dear Gear Guy,

*I want to junk my old dorm-room A/V system and buy a home theater setup. The picture on the TV should look impressive when my family and I are sitting on the couch, which is about 8 feet from our current TV. And I want a full-sounding speaker array — but my wife doesn't want it to eat up a lot of floor space. The system also has to accommodate all of my family's viewing and listening habits. My young daughter likes to watch children's shows, my son tunes in MTV and listens to CDs, my wife enjoys movies on DVD, and I watch a lot of sports. Is there one system that can meet all of our needs?*

**Family Man**

### Dear Family Man,

Kiss your dorm-room gear goodbye! I can recommend a terrific system that's perfect for suburbia. You should be able to buy all of the necessary components for less than six grand after discounts. Frankly, I think you'll be amazed at how good a system it is for the money, and how neatly it will fit into your living room.

Sony's DVP-CX870D DVD megachanger (\$799, reviewed in February/March) holds 301 discs, which should accommodate most of your family's favorite CDs and DVDs. Moreover, you can create folders to keep everyone's discs organized. As Daniel Kumin explained in his review, the Disc Explorer system organizer "brings up a full-screen, scrollable list of all loaded discs, including each one's format (CD or DVD), title, artist (for CDs), genre, and even a little thumbnail image." You can sort discs by slot number, genre, or title, which will make it a cinch for everyone in the family to find what they're looking for.

This is the only changer I know of that can flip over a DVD to play the other side or flip a CD that was inserted incorrectly. It also has a great remote control and a component-video output, plus a Dolby Digital (DD) decoder. Kumin's review concluded by saying, "If you like the idea of one box that lets you play, program, store, and organize discs in your music/movie collection, Sony's got it, without sacrificing video or audio performance."

But you won't need the Sony's decoder with Denon's AVR-3801 receiver (\$1,199, May) because it has DD and DTS decoding built in — including 6.1-channel decoding for the ultimate surround sound experience. It's rated at 105 watts per channel, which is more than enough for most living rooms, and it drives up to seven channels, so you can add a couple of back

surround speakers if you want to go all out. It also sports some nice ambience-enhancement processing for stereo sources.

Reviewer Ranada raved that the AVR-3801 "gives you nearly everything to keep you going in the multichannel age: ample power reserves, ultra-low background noise, up-to-date digital multichannel decoding, and, at last, a stereo-enhancement mode that'll keep your older recordings from going flat. All of this comes in an unusually well-balanced blend of performance, versatility, and ease of use at a reasonable price."

For speakers, I'd recommend B&W's DM 303 system (\$1,270, May), which comprises four DM 303 satellites (the photo at right doesn't show the surrounds), an LCR 3 for the center, and an ASW 500 subwoofer. These budget speakers, like most everything else B&W makes, provide high sonic quality and have styling to match. Reviewer Rich Warren said, "By using speakers for the front and surround channels that go deeper into the bass than is usual for their size, B&W avoids a common pitfall of sat/sub systems — the gap between the low end of the satellites and the upper range of the subwoofer — while maintaining such benefits as easy placement and excellent imaging from small enclosures."

The sub's amplifier is rated at 70 watts, and its cone is 10 inches, which should provide plenty of deep bass. One downside — the satellites aren't magnetically shielded, so you'll have to keep them away from the TV. And, of course, like any modest small-speaker ensemble, this one has its limits — it can play loud, but probably not loud enough to annoy the neighbors.

- **RCA MM36110 multimedia monitor (\$2,199)**  
www.rca.com, 317-587-4450
- **Philips DSR6000 DirecTV receiver and TiVo recorder (\$400)**  
www.philipsusa.com, 800-531-0039
- **Sony DVP-CX870D 301-disc DVD changer (\$799)**  
www.sel.sony.com, 800-222-7669
- **Denon AVR-3801 digital surround receiver (\$1,199)**  
www.del.denon.com, 973-396-0810
- **B&W DM 303 satellite speakers, LCR 3 center speaker, and ASW 500 subwoofer (\$1,270)**  
www.bwspeakers.com, 978-664-2870

For your viewing pleasure, let's try the 36-inch RCA MM36110 multimedia monitor (\$2,199, January). Its 4:3 aspect ratio screen can display a widescreen 1080i-format high-definition TV (HDTV) picture, but not with full resolution. The RCA set will accept progressive-scan component-video signals if you decide to upgrade to a DVD player with that capability, and it sports VGA-type jacks and USB ports for connecting a computer. Why would you want to hook up your TV to a computer? Well, so everyone can Web surf in the living room, for one thing. Reviewer Al Griffin pointed out that "the RCA did an excellent job of rendering fine text and graphics in both Web pages and word-processing documents." And he was pleased with the image quality overall. "In a high-def demo loop of *Texas Wild* . . . the familiar plants and critters looked crisp, with clean colors and eye-popping contrast."

The RCA set also features the free Guide Plus Gold interactive program guide, which displays listings for 48 hours ahead. The monitor doesn't have a line doubler, however, nor a 16:9 widescreen display mode, which shouldn't be a problem since the Sony DVD changer has better than average letterboxing capabilities.

Finally, the Philips DSR6000 DirecTV receiver/TiVo recorder (\$399, May) is a nice way to take this system to the next level without spending a bundle. Once you pay the DirecTV programming and TiVo subscription fees, you'll get satellite access neatly integrated with time-shift recording. That means you can access a zillion (well, more than 200) channels and watch shows any time you want by simply dumping the satellite signal to TiVo's hard drive, which allows up to 35 hours of original-broadcast-quality recording. TiVo also lets you zap through commercials and watch football games in a fraction of their broadcast duration — it'll even search out programs you might like. Two bummers — there's only one Favorites list, and current systems won't let you watch one show while recording another (a planned satellite-delivered software upgrade will allow this).

Reviewer Teri Scaduto concluded that "placing the DirecTV and TiVo services together in the DSR6000 gave me the heady feeling of having absolute control over the entire spectrum of satellite-TV options. . . . Philips has melded DirecTV and TiVo into one smoothly operating system — with one number to call for support and one monthly bill. It's a match made in TV heaven." ➤







## Dear Gear Guy,

*I sold my dot-com just before the crash and used the proceeds to buy a spacious suite overlooking Central Park. I require an A/V system that's impressive looking and powerful enough to fill my mammoth living area with sound. But you should know that I'm not a babe in the woods when it comes to A/V gear. I have owned many good systems, but now I want a damn good one. However, I simply don't have the time (or temperament) to deal with overly tweaky components or anything that needs endless programming. Thank you in advance for your consideration.*

### High-Powered Business Woman

## Dear High-Powered Business Woman,

First, let me say that if you're single, I think we should get together to plan this important installation. Let's earmark about 18 grand for a top-of-the-line system that combines performance and beauty.

We'll begin with the Onkyo Integra DPS-9.1 DVD player (\$1,800, reviewed in February/March). The first DVD-Audio/Video player to bear THX Ultra certification, it has a look and feel that will immediately convince you it's light years beyond those dime-store plastic models. The progressive-scan component-video output looks superb. David Ranada pointed out in his review that "the battle-scene preliminaries of *Braveheart*, with masses of soldiers extending into the distance, benefited from the player's extended resolution" and that "both *Toy Story* films actually looked better onscreen in our viewing room than they did in the movie theater." He concluded that he had "no hesitation in recommending the Integra DPS-9.1. It's capable of extraordinary picture quality worthy of the finest projection monitors."

There's also full Dolby Digital and DVD-Audio decoding and a multipin DB-25 analog multichannel output, which can greatly simplify hookup with compatible components. Interestingly, the player also has an IEEE 1394 (FireWire) output — which could be used in the future to simplify hookup even further by routing *all* of the audio and video signals through a single cable (the requisite adapter card isn't yet available). Of course, the DPS-9.1 also plays CDs and both CD-R and CD-RW discs.

A fine player deserves a fine receiver, which is why I recommend the B&K AVR307 (\$3,500, January), which Daniel Kumin called "a no-nonsense, high-performance receiver that gives up nothing sig-

nificant in A/V performance to the more expensive receivers on the market." The front panel is elegantly sparse, but it has more features than a 32-screen cineplex. Also a THX Ultra component, it has both Dolby Digital and DTS decoding, and includes THX Surround EX and DTS-ES decoding for 6.1 channels (which will make you the envy of your geekier male business associates). The seven 150-watt amplifier channels — which should pump out more than enough power to fill your swanky Central Park digs with sound — include separate outputs for two back surround speakers.

A neat feature lets you choose how many speakers will play in any mode (you could play stereo CDs over five speakers, for instance). There are also comprehensive equalization, crossover, and tone controls so you can fine-tune your multichannel system's sound. This receiver lets you operate the basics with just a few buttons, but there are also plenty of sophisticated controls to satisfy any audiophile urges you might have. Kumin concluded that the AVR307 "will certainly please the more technically adventurous shopper, as well as those who demand very high power and performance levels along with tremendous adaptability to different kinds of system setups and room acoustics."

Let's be honest. A high-class system has to look at least as good as it sounds — and for a beautiful lady like you, I'd recommend the beautiful MartinLogan Scenario speaker system (\$5,185, September 2000),

made up of the Scenario left/right front speakers, the Script surround speakers (not shown), and the Cinema center speaker. This system looks as good as it sounds, and it sounds utterly fantastic. Electrostatic speakers like these have a wonderfully clean, transparent sound that seems precisely natural.

Al Griffin affirmed that this system's "unique looks are sure to satisfy listeners who care about styling, while its hybrid dynamic/electrostatic design yields a refined sound that's a clear cut above what you'll hear from your average home theater speakers." This system's presence, imaging, and sense of spaciousness will impress even the snobby audiophiles who somehow manage to crash your parties.

But electrostatics do fall short in the bass. That's handled here by using conventional cone woofers for everything below 500 Hz. So if you like to rock out now and then, you'll want to add a powered subwoofer like the Velodyne SPL-1200 (\$1,399, June). This power-packed sub has a 750-watt Class D amplifier and a nice big 12-inch driver with a multilayer resin cone and die-cast aluminum basket. As Tom Nounsaine put it in his report, "When I ventured underground with *The Matrix*, *The Jackal*, and *End of Days*, the SPL-1200 put me in the subway, surrounding me with heavy ambient sound, shaking my floor and rocking my chair." The cabinet — a 15-inch cube — is a little large, but its black wood-grain vinyl finish is unobtrusive.

Finally, for your video needs, I recommend the Pioneer Elite Pro-510HD 53-inch widescreen rear-projection monitor (\$6,300, June). The 16:9 screen is set in a cabinet whose black lacquer finish rivals anything Steinway can offer. More important, it can display stunning high-definition pictures from an external HDTV tuner and almost as stunning standard-definition pictures from the Integra DVD player's progressive-scan output.

The Pioneer's line doubler also does a terrific job of converting standard interlaced video inputs to progressive scan. As a result, the set's picture "looked excellent with every source I tried," said reviewer David Katzmaier. "In the helicopter-attack chapter of *Apocalypse Now*, the deep orange and blue of the sky and sea look spectacular, and the shadows inside the choppers showed fine gradations of gray." But as with any videophile monitor, you might want to ask an expert for help in tweaking the factory settings a bit. So give me a call anytime.

- **Pioneer Elite Pro-510HD rear-projection HDTV monitor (\$6,300)**  
www.pioneerelectronics.com, 800-746-6337
- **Onkyo Integra DPS-9.1 DVD-Audio/Video player (\$1,800)**  
www.onkyousa.com, 201-785-2600
- **B&K AVR307 digital surround receiver (\$3,500)**  
www.bkcomp.com, 800-543-5252
- **MartinLogan Scenario front speakers (\$1,995), Script surround speakers (\$1,795), and Cinema center speaker (\$1,395)**  
www.martinlogan.com, 785-749-0133
- **Velodyne SPL-1200 subwoofer (\$1,399)**  
www.velodyne.com, 408-436-7270







# BEHIND

# The Numbers

## How to read our lab tests for DVD players

by David Ranada

**S**ome readers shy away from the “in the lab” boxes in our test reports, probably because it’s hard to judge what represents desirable performance if you don’t have a lot of experience with the kinds of figures we publish. To help you interpret how our numbers relate to what you see and hear, we’re going to lead you through the data in a series of articles discussing each of the major equipment categories, starting with DVD players.

For simplicity, assume that we’ve tested a DVD player equipped to play the new multichannel DVD-Audio music discs. Instead of actual test results, the “in the lab” box printed on the facing page shows the *ideal* result for each parameter. How to evaluate a *real* player’s measured deviations from theoretical perfection, or zero error, makes up the rest of the story. First, though, let’s take a look at how our test-data boxes are organized in general.

### The Layout

Each “in the lab” box is separated into sections covering the tested component’s performance in its major operating modes. Here it is a player’s video performance with DVD-Video discs and its audio performance with DVD-Audio discs and CDs. We’ll discuss Dolby Digital performance, which can make up a large part of some players’ test data, later in this series when we cover lab data for A/V receivers and amplifiers, where it’s more relevant to a purchase decision. (It’s better to have Dolby Digital decoding done at the end of the signal chain, where it can serve other source components, such as a satellite receiver or a high-definition TV tuner, in addition to the DVD player, and where the bass-management facilities may be better.)

Each section starts with a list of significant test conditions, which are chosen to represent typical equipment settings and typical input signals. We list these because they sometimes differ from “standard” industry practice, especially with receivers and amplifiers. Fortunately, few user settings on a typical DVD player affect measured performance, and we normally test a player with its default, straight-out-of-the-box settings. At the end of each lab box we print

comments by the tester, who will usually discuss any particularly surprising or unusual results or put the findings of key tests in perspective.

### DVD-Video Performance

Unlike the multiple audio measurements that appear in a player test, the video results are straightforward. The reason we use a composite-video connection for most of these measurements, by the way, is that it typically represents the worst-case output. S-video measurements, when applicable, will almost always be equal or better, so if the player performs well with composite connections, you can assume it will perform well with S-video, too.

**Maximum white-level error** indicates any errors in overall picture brightness that might need correction using your TV’s brightness controls. Many players come out of the box with a video output voltage that is too “hot” (high), and they can look slightly brighter than players with no maximum white-level error, measured in IRE (1 IRE is  $\frac{1}{100}$  of the ideal dynamic range of the luminance, or brightness, portion of a video sig-

nal). If you compare two DVD players that have significantly different maximum white levels (a disparity of 3 or 4 IRE) without compensating for the difference, you’ll probably prefer the one that produces a brighter picture, all else being equal, even though it may be a less accurate image.

At the opposite end of the video dynamic range, **setup level** indicates what IRE setting the player uses to represent black. The level for the direct-view monitors used in TV studios and during DVD mastering is normally +7.5 IRE, and setup discs like Ovation Software’s *Avia* also aim for that level. Any monitor/player mismatch here — specifically, the use of an “expanded” or “enhanced” black-level setting of 0 IRE in the player — will throw off the brightness scale on a TV adjusted for the +7.5-IRE standard. While this has the effect of increasing contrast, which many people find appealing, it also reduces the amount of detail visible in dark images or deep shadows.

**Differential gain and differential phase** are two traditional composite-video measurements that are helpful in evaluating videotape recorders but are not especially relevant to the quality of a DVD player. We continue to run them for comparison with other devices. Differential phase indi-



cates how much the color shifts as the point-to-point brightness of the picture changes, and differential gain indicates how much the brightness of the picture changes as the color shifts. Unless there's a direct comparison with a reference image, the eye is extremely tolerant of larger errors in both these parameters, especially differential gain, than we have ever measured from a DVD player.

**Luminance frequency response** (formerly called "horizontal luminance frequency response") is the best way to judge a DVD player's resolution performance. This measurement allows you to decide whether the picture detail you're seeing comes from accurate playback (a flat response with  $\pm 0$ -dB error up to 6.75 MHz) or from a "goosed" response (+0.5 dB or more between 4 and 6 MHz), which can make a picture seem sharper without necessarily conveying very fine detail. Better players will have flatter response up to a higher frequency than one that rolls off or has a "mid-range" boost.

If you're deciding between a player that rolls off slowly at the higher frequencies (say, -1 dB at 4 MHz, -3 dB at 5 MHz, and -8 dB at 6.75 MHz) and one that is flat throughout the range but down 10 dB or more at 6.75 MHz (the DVD-Video format's limit), choose the latter. A player that has flat response will provide a sharper-looking picture than one that rolls off.

To cross check our luminance-response measurements, and to give readers a resolution figure with the more familiar "lines of resolution" as the units, we use **onscreen horizontal resolution** (formerly just "onscreen resolution"). It's one of two DVD player tests we make (the other is in-player letterboxing) that are judgment calls, meaning that the numbers aren't spit out by a machine. Each requires looking at a test pattern on a TV screen and deciding what the result is for that test. The test pattern in this case is the 200-line resolution "wedge" chart of the *Avia* test DVD (Figure 1, next page). The area we look at is the bottom of the right-hand vertical wedge, and what we look for is the point where the closely spaced vertical lines turn to a gray mush, with no vertical line structure visible. That point, if it occurs at all before the bottom of the wedge is reached, is converted to a resolution measurement by reading off the scale next to the grayed-out point of the wedge.

Nearly all DVD players have enough output at the format's resolution limit of 540 lines (equivalent to the 6.75-MHz limit for luminance frequency response) to merit a 540-line reading for onscreen horizontal

resolution. The few that don't still might not look obviously "soft" with movies, because their response at lower frequencies is flat or boosted and because the amount of fine detail that benefits from full 540-line resolution is small.

**Pixel cropping**, measured using a test pattern from *Avia* (Figure 2), is important only if your TV can show a full video image without "overscan," since it indicates where and by how many pixels a player cuts off the edges of the image data as it is converted into a video signal. Not many TVs meet this

criterion — mainly some projection sets and some widescreen TVs that show standard 4:3 aspect ratio fare with letterboxing bars on the sides (DVD playback even over a computer monitor can introduce pixel cropping). If you have that kind of a set and want to see the entire recorded frame, the less pixel cropping in the player, the better. The losses are almost always trivial, but hard-core videophiles get quite worked up about them.

**In-player letterboxing** indicates the visible quality of a player's conversion of an anamorphic or "enhanced for widescreen"

## in the lab

### DVD-VIDEO PERFORMANCE

Measurements are made from a variety of DVD test discs, all through the player's composite-video output except as noted and using the factory-default picture settings.

Maximum white-level error ..... 0 IRE  
[the closer to 0 IRE, the better]

Setup level ..... +7.5 IRE  
[+7.5 IRE matches most TVs]

Differential gain ..... 0%  
[the closer to 0%, the better]

Differential phase ..... 0°  
[the closer to 0°, the better]

Luminance frequency response  
(re level at 1 MHz)

at 4 MHz .....  $\pm 0$  dB  
at 5 MHz .....  $\pm 0$  dB  
at 6 MHz .....  $\pm 0$  dB  
at 6.75 MHz (DVD-format limit) .....  $\pm 0$  dB  
[the closer to 0-dB deviation, the better]

Onscreen horizontal resolution ..... 540 lines  
[the DVD-format maximum]

Pixel cropping ..... left 0, right 0, top 0, bottom 0  
[the closer to 0 pixels, the better]

In-player letterboxing ..... good  
[most players are poor]

Component-output level error  
Y/P<sub>r</sub>/P<sub>b</sub> ..... 0/0/0%  
[the closer to 0, the better]

Component-output timing error  
P<sub>r</sub>/P<sub>b</sub> ..... 0/0 nanoseconds  
[the closer to 0 nanoseconds, the better]

### DVD-AUDIO PERFORMANCE

All tests use computer-generated signals of 24-bit resolution on a custom-made test DVD-R. The signals contain dither, which sets limits on measured distortion and noise performance. Results are representative, not necessarily worst-case. In all cases, the kHz figures in the test conditions (left) represent the sampling rate of the digital test signal.

Noise level (re -20 dBFS, A-wtd)  
all sampling rates ..... -124.1 dB  
[lower is better down to this theoretical minimum;  
still lower figures may indicate a problem]

### Frequency response

44.1 kHz ..... 20 Hz to 20 kHz  $\pm 0$  dB  
48 kHz ..... 20 Hz to 24 kHz  $\pm 0$  dB  
88.2 kHz ..... 20 Hz to 44.1 kHz  $\pm 0$  dB  
96 kHz ..... 20 Hz to 48 kHz  $\pm 0$  dB  
176.4 kHz ..... 20 Hz to 88.2 kHz  $\pm 0$  dB  
192 kHz ..... 20 Hz to 96 kHz  $\pm 0$  dB  
[the closer to 0-dB deviation, the better]

Excess noise (re perfect 24-bit performance)  
all sampling rates ..... 0 dB  
[the closer to 0 dB, the better]

Noise modulation (-40 to -150 dBFS)  
all sampling rates ..... 0 dB [lower is better]

### CD AUDIO PERFORMANCE, ANALOG OUTPUT

All tests except defect tracking are performed using *Sound & Vision's* test CD-RW (or CD-R). All test signals contain dither, which sets limits on measured distortion and noise performance.

Maximum output ..... 2 volts  
[the conventional maximum level for digital audio devices]

Frequency response ..... 20 Hz to 20 kHz  $\pm 0$  dB  
[the closer to 0-dB deviation, the better]

Noise level (re -20 dBFS, A-wtd.) ..... -75.9 dB  
[lower is better down to this theoretical minimum;  
still lower figures may indicate a problem]

Excess noise (with/without sine tone)  
16-bit (EN16) ..... 0/0 dB  
quasi-20-bit signal (EN20) ..... 0/0 dB  
[the closer to 0 dB, the better]

Distortion (THD+N, 1 kHz)  
at 0 dBFS ..... 0.00153% [lower is better]  
at -20 dBFS ..... 0.0153% [lower is better]

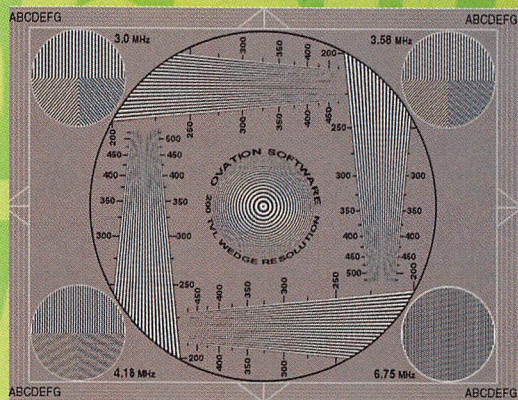
Linearity error (at -90 dBFS) ..... 0 dB  
[the closer to 0 dB, the better]

Noise modulation (-40 to -120 dBFS) ..... 0 dB  
[the closer to 0 dB, the better]

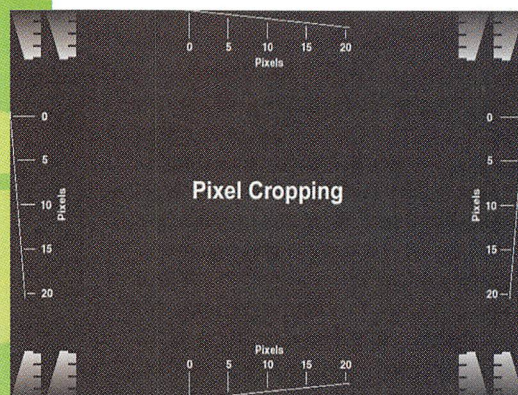
Defect tracking  
(Pierre Verany test disc) ..... 3,000  $\mu$ m  
[higher is better up to this test-disc maximum;  
the CD-standard minimum is 200  $\mu$ m]

The notes section following the measurements is where the reviewer will comment on anything unusual and put the key figures in perspective.





**Figure 1.** We use this *Avia* test pattern to evaluate onscreen horizontal resolution. We look at the bottom of the righthand vertical wedge and judge where the lines in it turn to a gray mush, indicating the player's resolution limit.



**Figure 2.** This *Avia* screen, used to measure pixel cropping, requires a special monitor for viewing since most TVs themselves cut off pixels at the edges of an image. A monitor that shows the full frame without "overscan" lets us judge how many pixels a DVD player cuts off on each side in the signal it supplies. If you don't have such a monitor, the pixel-cropping "measurement" is of little significance.



**Figure 3.** The *International Man of Mystery* helps us evaluate in-player letterboxing. If it's poor, as is usually the case, the dots in his polka-dot shirt will sometimes look like stripes as he moves around. In-player letterboxing is relevant *only* if you watch anamorphic ("enhanced for widescreen") 16:9 DVDs on a standard 4:3 screen.

DVD for display on a standard 4:3 screen, so it's relevant *only* if you watch on a 4:3 screen. This is the single most subjective "measurement" we make of a DVD player, but also the one where differences between players are most easily visible.

Letterboxing is a mathematical transformation of the video data, similar in principle to an audio sampling-rate conversion. Depending on what equations are used, various artifacts can be generated on images that contain closely spaced horizontally oriented patterns, like thin Venetian blinds, or tight patterns that move through the horizontal plane, as in the "test pattern" we use — the polka-dot shirt Mike Myers wears in Chapter 8 of *Austin Powers, International Man of Mystery* (Figure 3). With players that have "poor" letterboxing, the shirt will appear both dotted and striped as Myers moves around because the letterboxing artifacts distort the dots so they run together. "Good" in-player letterboxing will consistently produce dots only. "Fair" players fall somewhere in between, with faint striping visible at times. Most players have clearly poor performance in this test, the tough call being between the few that merit a good or fair rating.

**Component-output level error** indicates mistracking between color and brightness, though with component video these are conveyed as three distinct signals (luminance and two color-difference signals). Large errors here can result in color and brightness shifts that may not be correctable using a screen's picture controls. A ballpark figure for "good" performance is any value within  $\pm 5\%$ .

High values of **component-output timing error** (greater than  $\pm 10$  nanoseconds) can lead to color-fringing effects on hard-edged objects in an image. Smaller error values are not generally visible.

## Audio Performance

We measure the same basic parameters for DVD-Audio and CD playback. For space reasons, CD measurements are often omitted in our published reports, but if there's anything unusual about them, whether positive or negative, it'll be mentioned in the notes following the measurements. Keep in mind that if you use a player's digital audio output only, feeding its signals (including Dolby Digital and DTS soundtracks) to a digital surround receiver or preamplifier/processor, measurements of its CD and (if applicable) Dolby Digital or DTS performance become irrelevant to a purchase deci-

sion, with the sole exception of CD defect tracking.

**Maximum output level** is also not something to base a purchase on. We measure it and publish the results on the off chance that you'll do a head-to-head listening comparison between players that deviate enough from the typical output level of 2.0 volts to make one seem better than the other for that reason alone. If Player A has a maximum output level, say, of 1.88 volts and Player B's is 2.12 volts — a 1-dB difference — Player B will almost always be preferred in a listening comparison regardless of any other measurable differences. Since you can compensate for below-par maximum output by turning up the volume setting slightly, it's not a significant "defect" unless the output level is *very* low, because raising the volume will also increase the background noise.

**Frequency response** was of supreme importance in the heyday of the LP record. It still is important, but since so few digital disc players we've encountered deviate from *audible* — if not *measurable* — perfection in this respect, it is almost a moot point now. Deviations of 0.1 dB or less from 20 Hz to 20 kHz in *any* audio frequency-response measurement can be considered audibly perfect. Larger deviations may occur at both ends of the frequency range, especially with cheap or portable players, but unless they are *very* large (greater than 1.5 dB), it's unlikely they'll be audible either.

For all sampling rates above 44.1 kHz, the ideal upper-frequency limits for DVD-Audio performance are precisely half the sampling rate, as shown in our sample lab box. None of the DVD-Audio players we've tested so far get up this high — in fact, all of them cut off at virtually the same frequency and with the same decibel variation. That's because many of them are using the same digital-to-analog (D/A) converter chips! Not to worry — if you're old enough to read and understand this article, you can't hear anything above 24 kHz anyway, and probably not even above 18 or 19 kHz.

Measurements of **audio distortion** (THD+N, or total harmonic distortion plus noise) are always stated in percent mainly out of tradition. I have yet to see a DVD player that has an audibly significant distortion percentage — greater than 0.1% if you're really critical, or 0.3% if you're not — certainly not at full output level (0 dBFS) and not even at our reference level ( $-20$  dBFS). If you're going to use a player's analog outputs, anything more than 0.3% distortion should disqualify it from considera-



tion, regardless of any other virtues it may have. But if you're using its digital outputs, the only relevant distortion measurement is of the digital receiver or preamp you connect it to.

To be more useful in distinguishing one player from another, distortion should be measured like noise level, in decibels below some reference, and then you could compare the two figures (ideally, they'd be within 3 dB of each other). But that is a really radical concept to some, who take (false) comfort in the seemingly more friendly percentage concept. The problem is, perfect distortion performance is *not* zero but is limited by the resolution of the test signal.

For CD players, theoretically ideal distortion performance should be 0.00153% at 0 dBFS and ten times worse at -20 dBFS (0.0153%). For DVD-Audio players, the test disc we're now using, which is the only one I've been able to track down so far, doesn't have suitable signals for distortion measurements (but I hope this will be remedied within the year). In any case, lower distortion is better.

**Defect tracking** is the most variable measurement we publish since merely reloading the Pierre Verany test disc (which has data-layer errors in ascending calibrated sizes engraved on it) can produce slightly different results each time. Nonetheless, no better "objective" test for this characteristic is available. The *minimum* defect-tracking required of a player by the CD standard is 200 micrometers ( $\mu\text{m}$ ). Ideally, a player should track defects up to the 3,000- $\mu\text{m}$  *maximum* on the Pierre Verany test disc — in any case, the higher the figure in our lab results, the better.

## Noise-Related Audio Performance

Four of our standard audio measurements are so closely related I'll discuss them together. Our noise-level, excess-noise, noise-modulation, and linearity-error tests combine to make things difficult for a player. It's hard to perform well on all four tests simultaneously, and if a player does poorly in one of these tests, at least one of the others will usually show nonideal behavior as well.

The most conventional and easiest to understand is **noise level**, which measures how far the player's inherent background noise (consisting of hiss as well as hum and buzzes from the power supply) falls below our standard reference level, which is *not* full output but 20 dB below that (-20

dBFS). All of our noise-level measurements use A-weighting, which (approximately) corrects for how the ear's sensitivity to low-level sounds varies with frequency. We also use a special "dither" signal (random extremely low-level noise) for this test, not an all-zeroes data stream as in other methods of measuring noise, so the figure representing theoretically perfect performance is *not* minus infinity ( $-\infty$ ) but is instead set by the resolution of the medium.

The resulting noise-level figure should be as close as possible to the theoretical minimum *without going lower*. For 16-bit CD audio, perfect performance is -75.9 dB. For DVD-Audio using 24-bit data, perfect performance would be 48.16 dB lower, or -124.1 dB. I don't expect any DVD-Audio player ever to measure that low, however. Most players will be closer to 20-bit performance, or -100.0 dB, at which level a perfect DVD-Audio recording should have absolutely no audible background hiss at any reasonable listening volume.

**Excess-noise** figures explicitly measure a player's departure from an ideal level of background noise. For a CD player, this test — which so far is exclusive to **Sound & Vision** — quantifies how much higher (or lower) than perfect the player's output level is with four types of signal: 16-bit (EN16) and quasi-20-bit (EN20) dither, both with and without a low-level sine-wave signal superimposed, in a frequency band that's squarely within the ear's region of greatest sensitivity. Ideally, *all* excess-noise figures should be 0 dB, meaning that the player adds no noise or distortion to the dither signal in the frequency band we look at. In practice, we've seen 0-dB EN16 and single-digit EN20 performance with CDs played on the latest DVD-Audio gear. If the results aren't exactly zero, then the "with sine tone" figures should be within 1 dB of the "without sine tone" figures.

When it comes to DVD-Audio playback, the excess-noise figure represents, again, the amount of noise added to a theoretically perfect 24-bit signal. I don't expect ever to see 0-dB EN24 results. Probably the best that can be expected is approximately 20-bit performance, or excess noise around +24.1 dB. As long as a player comes close to that figure, its inherent noise is unlikely to ever be audible.

**Noise modulation** measures how much the background-noise and distortion levels change as the signal level changes over a very wide range. Ideally, it should be 0 dB. Typical, and excellent, values for CD playback are less than 0.5 dB, with noise

modulation figures as great as 3 dB usually being of no audible consequence.

**Linearity error** measures the level difference, plus or minus, between a -90-dB signal on our test CD-R and the player's analog output as it plays that track. Such very low-level recorded signals often prove difficult to reproduce accurately, but errors are still usually much less than a decibel (zero error is ideal). A relatively large error (greater than 1 dB) often shows up also as noise modulation (which can be generated by the same mechanisms as a negative linearity error) or higher-than-theoretical noise or excess-noise figures (a positive error).

## Ranking the Readings

Given the generally high level of performance we've been seeing from recent DVD players, not all the measurements we've been making are now of equal importance for your buying decision. You can usually skim over the audio frequency response and distortion measurements. All of these are unlikely to be less than very good. The notes at the end of "in the lab" will mention anything unusual.

Some other measurements might be irrelevant for a different reason, not because every player is equally good but because they don't apply to your viewing situation. If your TV doesn't have component-video connections, the two component-output measurements have no bearing. In-player letterboxing is very important if you're watching on a 4:3 screen, irrelevant with a widescreen 16:9 set.

If I had to pare down the lab-test figures to the minimum that could be decisive in choosing one player over another, I'd rely on *luminance frequency response* and *in-player letterboxing* for video. On the audio side, the *excess noise* and *noise modulation* results should hold sway because, of all our audio tests, they're the hardest things to get right.

Of course, such a minimalist view assumes that your mind hasn't already been made up by some other, more subjective aspects of the players' performance — things we can't measure in the lab but that our reviewers always discuss in detail in their reports. How easy it is to use the remote control, for instance, or to find what you need in the onscreen menus are things that should weigh just as heavily in your purchase decision as the most important lab results, and maybe even more so. **S&V**



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# Sound All Around

Finding the right way to add  
multiroom audio to your home

by John Sciacca



**L**et's see a show of hands. How many of you out there have wished you could take the sound from your stereo or home theater system and send it to another room in the house — maybe *every* room in the house? I thought so. But you probably haven't acted on your impulse because you were worried about the trouble and expense. Let me tell you a little story.

I'm the lead system designer for a company that does everything from simple two-room audio systems to whole-house A/V installations. We recently had a cus-

tomers who wanted to route music beyond his listening room but didn't know how sophisticated a system he would need. We recommended one that could send different music to three different parts of the house. Since only three people were living in the house, though, he wasn't sure he needed three independent zones.

Well, after living with the system for a year, he came back and told us that his whole family was not only listening to *more* music, but also a greater variety of music because it was so easy! With keypad controllers in every room, music is always

right at their fingertips. So, instead of Britney and N'Sync, his kids are exploring James Brown, Elvis, and Vivaldi thanks to the CDs loaded in the family's 101-disc changer. If that isn't a good enough argument for multiroom audio, I don't know what is.

Just about anyone who lives in more than one room — and I expect that includes everybody reading this — would probably find some advantage to having multiroom audio. But there are a few questions you should ask yourself before you plan a system:

ILLUSTRATION BY JACK GALLAGHER



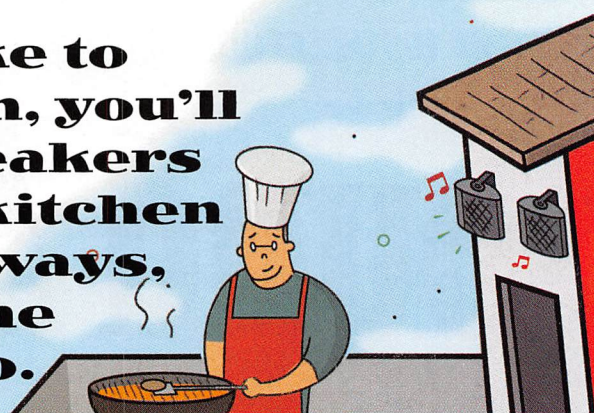
• **First — and most obvious — do you really need one?** While it might seem cool to have music in your bedroom or kitchen, installing a sophisticated system will be a waste of time and money if you and the other members of your family still do most of your listening using the primary system, or if your current bedroom or kitchen radio already fits your needs for casual listening.

• **Will it be practical to install a system?** The best time to plan your system is before you have a new home built. But what if you want to add something to an existing home? Are your walls made of brick or poured concrete, or is it a traditional wood-frame construction? Do you have a basement, a crawl space, or a concrete slab? Is there attic access above each room, or does the house have more than one story? If you have an older house (pre-1920), you probably have plaster-and-lath or brick walls, and it can be a nightmare to snake wires or install controllers in them. It's possible to install a system in any kind of house, but it can get considerably more expensive when the house's construction gets in the way.

• **Do you have the money?** Custom installation isn't cheap, and if you've been putting aside some cash to buy new gear for your main system, you might be better off improving the sound or image quality there than spreading your dollars thinly throughout the house. There are some do-it-yourself options, which I'll cover in what follows, but they're limited — especially if you happen to be all thumbs.

Right, Russound's Direct Source Control keypad; below, the VIA! touch panel from Elan Home Systems.

## If you like to entertain, you'll want speakers in your kitchen and hallways, and on the patio, too.



If you've considered all these questions and still come to the conclusion that a multiroom audio system is right for you, then you're ready for the next round:

• **How many rooms do you want the sound to go to?** Think about where people listen to music in your home — and where they *would* listen if they could. If you like to entertain, you'll probably want speakers for the dining room and maybe the kitchen, hallways, and patio as well. The kids will want music in their bedrooms, and you might want it in yours, too. Dens, rec rooms, bathrooms, and garages are other good candidates for multiroom sound.

• **How is the music likely to be listened to in each room?** If you do a lot of movie watching in the bedroom, you'll want decent speakers. (We'll talk about adding video to the system in a future article.) But if you only want background music for parties in the dining room, why spend the money for better speakers there that will never be played loud or used for serious listening?

• **How do you want to divide your multiroom-audio dollar?** Speaker quality will have a lot to do with how much money goes where, but so will the system controllers. In a smaller house, it might be convenient just to step into the room where your main system is located

to select a remote audio source. In this case, all you'll need is a volume control in every other room that has speakers. But if you have a large house and a sophisticated system, you might want more elaborate keypad or touch-panel remote controls in the rooms where you do most of your listening. And if you're running wire to the nether regions of a really big house, you'll need to

budget for separate amplification for each room you wire.

You can save money by incorporating as much of your current gear into the multiroom system as possible. While the components are usually the smallest part of the bill for elaborate whole-house installations, with a more modest system you can save a good chunk of change by working in your own electronics — particularly any decent source gear (a CD megachanger, a DVD player, a tape deck). If you're planning to send the sound to more than one additional room, you'll need to add extra amplification, using either a speaker selector or one or more multizone amplifiers. You might be able to reuse old speakers you've saved, but to maximize the convenience and minimize the clutter of having sound in additional rooms, you should avoid using any large speakers, especially floor-standing models, outside your main system.

There can be quite a bit of design and wiring involved in installing a multiroom audio system. While a do-it-yourselfer should be able to install a basic system, consult a professional custom installer if you're thinking about running audio to more than one additional room (see "The Right Man for the Job," facing page). It takes more than simply pulling wire from Point A to Point B, and often the difference between a system that provides years of enjoyment and one that doesn't work well — or not at all — is in the planning and execution, where professionals have a big edge.

### Multiroom 101

The most basic multiroom audio system consists of two pairs of speakers and a stereo receiver that lets you play the pairs either separately or together. Connect your main speakers to the A terminals and wire a pair in any other room to the B terminals, and *voilà!* — multiroom audio is yours. But this system isn't very flexible. People in both rooms will hear the same music at the same volume, unless you turn one pair

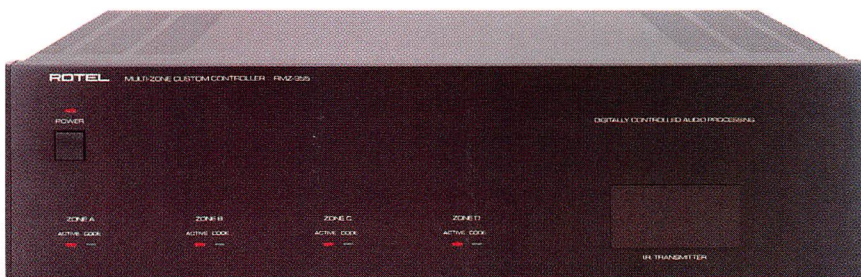




off because you don't want any audio in that room. If you already have a CD player, main speakers, and a stereo receiver with A/B speaker outputs to work with, this system will cost you as little as \$200 or less for the second set of speakers and a few bucks for the wire.

Even a system this simple can pose a big challenge for the inexperienced DIYer: installing the speaker wires. Sure, you could just run them along the baseboards, across entranceways, or under the carpets, but that could pose a tripping hazard — even a fire hazard. If you live in an old house and can't string the wires through the attic or the basement, do yourself a favor and hire a custom installer to run them for you. And think twice before breaching your walls to install a pair of in-wall or on-wall speakers — you're probably better off leaving that to a pro. (For more on the joys and perils of installing your own in-walls, see "The Setup," November 2000.)

If you want to send sound to *more* than two additional rooms, you're going to need a speaker selector. (Don't — repeat: *Do not* — even think about adding any additional speakers by twisting their wires together and cramming them into your receiver or amp's speaker outputs. That's a great way to fry the output stages.) Speaker selectors evenly distribute the power to several pairs of speakers and provide the amplifier with a constant, manageable impedance that will keep it from killing itself. But even with a speaker selector, you'll want to make sure you select a rugged receiver or amplifier to drive it. One



**Rotel's RMZ-955 is an example of a multisource controller/amplifier that can send 25 watts per channel to speaker pairs in four different areas of your home.**

that's UL listed down to at least a 4-ohm load (preferably 2 ohms) will have no problem driving whatever you feed it. Denon's DRA-685 (\$499) and Rotel's RX-975 (\$699) stereo receivers are more than up for the job. (You'll still be sending the same source at the same volume to all the rooms, though.) Many companies make speaker selectors, including Niles, Monster Cable, Phoenix Gold, and Sonance. Basic, four-pair selectors start at about \$100, while a ten-pair selector can go for as much as \$700.

### Next Stop . . . the Multi Zone

You might be thinking, "Sure, having music all around the house sounds great, but I don't want to have to listen to what my wife is listening to." For you, we have the next level of control: multizone.

With a multizone system, you divide your home into areas that can each play a different source. Each zone can contain as many rooms or speakers as your electronics can sustain. The simplest and most common way to set up such a system is to use a multiroom/multisource receiver, which lets one person watch a DVD in the living

room with the full glory of 5.1-channel sound while someone else peacefully enjoys a CD (or tape or radio) in the bedroom. You can find this feature on many digital surround receivers that sell for around \$1,000 or more, such as Yamaha's RX-V100 (reviewed in February/March) or Pioneer's VSX-39TX (reviewed in January). Your receiver might already have this capability — check the manual.

With more elaborate systems, you divide your home into as few as three zones or as many as twenty or more. The big advantage of these systems is that you don't have to have radios, boomboxes, and mini-systems scattered all over the house. Think about the possibilities: you can be out in the garage listening to Dick Vitale calling the plays while your wife tunes into Casey Kasem in the kitchen and your teenager plays the latest Top 40 album in his bedroom. But these more sophisticated systems can cost big bucks. A basic three-zone system, installed by a professional (we're rapidly moving beyond the capabilities of the average DIYer), will cost you at about \$6,500 for source components, controllers, wire, and labor, while a state-of-the-art six-zone baby can easily run tens of thousands.

Multizone systems are described by the number of zones and sources they can handle. A three-zone/six-source system, for instance, can send audio from six different sources (any combination of CD and DVD players, tuners, digital satellite systems, VCRs, hard-disk recorders, and so on) to three different areas. (These systems can also be set up to distribute video as well — a topic we plan to cover in a future article.) Complete multizone systems are available from companies like Audio Design Associates (ADA), Crestron, Elan, Niles, Rotel, Russound, and Sonance.

A multizone controller or preamplifier, which typically costs from about \$1,000 to \$10,000, is the heart and soul of a system. Make sure you know what peripherals (such as keypads and touch panels) are available for it and that it supports all of the options you want (such as relays for automatic operation of your lighting and

## THE RIGHT MAN FOR THE JOB

Before you go running down to the local RadioShack to pick up a spool of speaker wire, you might want to ask yourself a couple of questions. Is saving a few hundred dollars in installation costs worth the risk of having a system that doesn't do what you really want it to? Do you know all of the building codes in your area that govern pulling wiring through walls in a house?

If you're building a new house, you might be thinking of having the contractor do the multiroom audio installation for you. Surely his electrician can pull a couple of extra wires for a music system. Wire is wire, right? Wrong! Your project will most likely use at least four different types of wire, and the wrong wire is as good as no wire at all. Builders are great at

building your home, but they're rarely audio experts (and you shouldn't expect them to be). Besides, a contractor isn't likely to know how to prewire your house so you can slowly add to your system as the money becomes available.

Never fear! There are professionals who can help you through all stages of the project, from initial system design through prewiring to final installation. The best way to find a pro is through referrals from friends who've had systems installed or by contacting the Custom Electronic Design & Installation Association, or CEDIA (800-669-5329). The organization's Web site ([www.cedia.org](http://www.cedia.org)) has a database that will help you find a certified installer in your area.

— J.S.





From top: Thiel Audio's PowerPoint on-wall speaker, Definitive Technology's Ultimate series in-wall speakers, B&W's Cinema in-wall speaker, and the AT8700 in-wall speaker from Niles Audio.

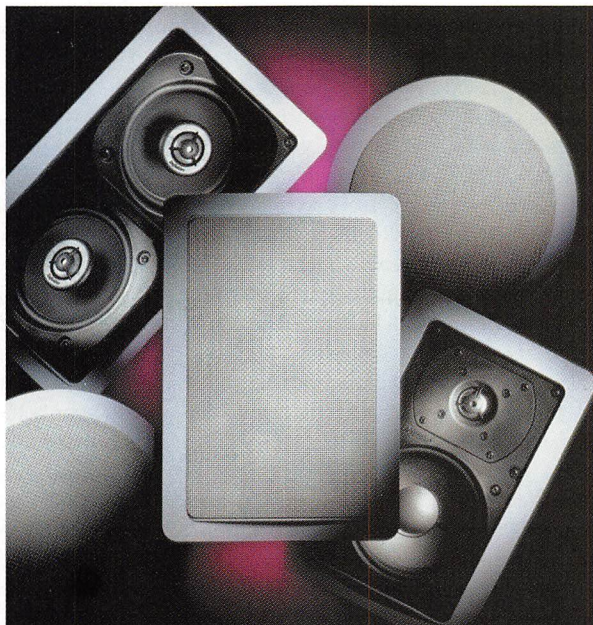
drapes and the ability to interface with your phone system) before you commit to buying one.

### Be a Control Freak

The more rooms you have hooked up to your system, the more important it becomes to be able to control where the sound is going and what happens to it once it arrives at its destination. At the most basic level, you want to be able to raise and lower the volume in each room. Volume controls typically look like light dimmers and come in the most popular decorator colors. Available from brands like Sonance, Niles, Russound, and Elan, they usually cost about \$40 to \$125. Look for one that offers at least 10 to 12 steps to give you a smooth transition from silence to full volume. Also, make sure the control will allow you to continue to hear audio from the speakers while you adjust the volume.

Infrared (IR) controllers offer a much wider range of control than simple volume adjustment. An IR system can either work on its own or with a wall-mounted volume control. But instead of allowing you to adjust only the volume, you can use these systems to control all of the gear in each room by pointing the remote (which can be one you're currently using to operate your other gear) at the IR "target." These IR control systems typically cost about \$100 to \$250 and are available from manufacturers like Niles, Sonance, and Xantech.

If the idea of an IR control system raises visions of not having the remote with you when you most need it, or of losing it under a couch cushion in some farflung room



of the house, you might prefer a keypad system. Keypads mount on the wall like volume controls and offer a terrific degree of control. Playing a CD is as simple as pressing a button marked play. Don't like the disc that's playing? Use the keypad to skip to a new one. Tired of CDs? Jump to your favorite radio station. Keypads come in all kinds of configurations and typically run between \$350 and \$750. Several companies offer them, including Elan, Niles, Russound, and Sonance.

If you demand the utmost in control, consider a touch panel. These devices do even more than keypads — like displaying full-motion video. They allow for easy operation of your lighting, HVAC, and security systems, and can even let you surf the Web or check out who's standing at the front door. Of course, for something this sophisticated you're going to have to pay big — *real* big. Prices start at \$2,000 and go up from there. The most popular models come from Crestron, Elan, and Panja.

### Speakers of the House

Regardless of the level of control, you're going to need decent speakers throughout your multiroom system. Most of these systems

send a stereo signal to each zone, so you'll want to be careful about where you place each member of the speaker pair. Don't put the left-channel speaker in one room and the right-channel speaker in another. If you do this and then pop in one of the early Beatles albums, you'll find John, Paul, George, and Ringo singing in the bathroom while their instruments play in the dining room. You can get mono-summing speakers, however,

that take the signals for the left and right channels and play them through a single speaker. These can be handy in small spaces like bathrooms where there isn't enough room for two speakers.

Speakers come in all shapes, sizes, and configurations, but for the rooms beyond your main system you'll want to concentrate on using in-wall, on-wall, and bookshelf models. While there might be some tradeoff in sound quality with some of these speakers, they can more than make up for it through their ease of installation and ability to blend into the décor. Get the best speakers you can afford, of course, but







## You're going to want to have good speakers throughout your multiroom audio setup.

remember that you're going to be using them primarily for listening to background music. You're probably not going to be slipping off to the kitchen to check out the 96-kHz/24-bit sonic detail of a new DVD-Audio disc.

In-wall speakers are definitely the way to go if you want speakers that will blend right in with whatever room they're in. Round ceiling speakers fit in particularly well with newer homes that use round, recessed can lighting in the ceilings. Rectangular speakers blend right in on walls with rectangular objects like pictures or windows. (In general, you'll find that you'll get much better sound with the speakers mounted in the wall, at ear level, then by having the sound come from the ceiling.) Most in-walls come with white frames and grilles, but they can usually be painted to match your décor.

Just about every speaker manufacturer has an in-wall line, but you can start by checking out the offerings from B&W, Definitive Technology, Niles, Sonance, and Triad, to name a few. Expect to spend between \$200 and \$500 for a nice pair and \$1,000 or more for in-walls that can give your main speakers a run for their money.

Some people feel they get better sound by using speakers that are flush-mounted on the wall, but with the drivers raised above the surface. On-wall models can cost much more than your average pair of in-walls. The PowerPoint speakers from Thiel Audio, for instance, cost \$1,300 each. If cutting holes or running wires through walls isn't an option, however, you'll want to rule out both in-walls and on-walls and go right for a pair of bookshelf speakers, which you can mount on wall brackets or place on, uh, shelves. Just about any good pair of bookshelf models will do.

And then there are outdoor speakers, for your patio, deck, pool, or yard. Yes, you can get speakers that look like rocks and can resist all kinds of weather. But many outdoor speakers are essentially more rugged variations on bookshelf models, and some can hold their own against their

housebound brethren. You can get decent outdoor speakers from mainstream manufacturers for around \$250 to \$400 a pair, and some really serious ones for \$1,000 and up.

### And Then You Get the Power!

These speakers aren't going to power themselves, so you're going to need additional amplification beyond what you're using for your main rig. The good news is that small speakers are usually pretty efficient — they can often produce a sound-pressure level of more than 90 dB with just 1 watt. And you do have options. You can use either a multichannel amp, a large amplifier in conjunction with a speaker selector, or several amps. With a multizone system, you'll need at least one amplifier for each zone.

Using a speaker selector may degrade the sound a bit, since running the audio signal through the selector's buffer resistors may reduce the amplifier's current and damping factor, causing a rolloff in bass response. But you'll save a lot of money over any of the other options. If you go this route, you should allocate at least 15 watts to each speaker. To determine this, just di-

vide your amp's rated output by the number of speakers connected. For example, a two-channel amplifier rated at 100 watts per channel will yield about 16 watts per channel when connected to a six-pair speaker selector.

A multichannel amp means something different for multiroom sound than it does in home theater. For surround sound, you want a five-channel amp, since subwoofers generally have their own amps. But for sending audio throughout the house, you'll need an *even* number of channels. Many companies offer six-channel amplifiers that can drive three pairs of speakers for about \$500 to \$1,000. ADA, Audio Access, Niles, Sonance, and others have 12-channel models that sell for \$2,000 and up. Crestron has a 16-channel, 1,000-watt behemoth that goes for \$3,500.

**D**on't let all of the possibilities get in the way of enjoying music throughout your home. If the terminology and technology get to be too much for you to sort through, let a professional installer do the sorting for you. If he does his job right, you'll end up with a system that's as easy to use — probably even *easier* to use — than the one you have now. When it comes right down to it, multiroom audio is all about enjoying *what* you want, *where* you want, *when* you want. And a well-designed and well-executed system will give you just that. **S&V**

**John Sciacca** is the lead system designer for Custom Theater and Audio, a CEDIA member organization, in Murrells Inlet, South Carolina.

## MANUFACTURERS

How to reach companies mentioned in this article

### Audio Access

www.audioaccess.com

### Audio Design Associates

www.ada-usa.com, 800-432-8346

### B&W Loudspeakers

www.bwspeakers.com, 978-664-2870

### Crestron

www.crestron.com, 800-237-2041

### Definitive Technology

www.definitivetechology.com, 410-363-7148

### Denon

www.del.denon.com, 973-396-0810

### Elan Home Systems

www.elanhomesystems.com, 859-269-7760

### Monster Cable Products

www.monstercable.com, 415-840-2000

### Niles Audio

www.nilesaudio.com, 305-238-4373

### Panja

www.panja.com, 469-624-8000

### Phoenix Gold

www.phoenixgold.com, 503-286-9300

### Pioneer

www.pioneerelectronics.com, 800-746-6337

### Rotel

www.rotel.com, 978-664-3820

### Russound

www.russound.com, 800-638-8055

### Sonance

www.sonance.com, 800-582-0771

### Thiel Audio

www.thielaudio.com, 859-254-9427

### Triad

www.triadspeakers.com, 503-256-2600

### Xantech

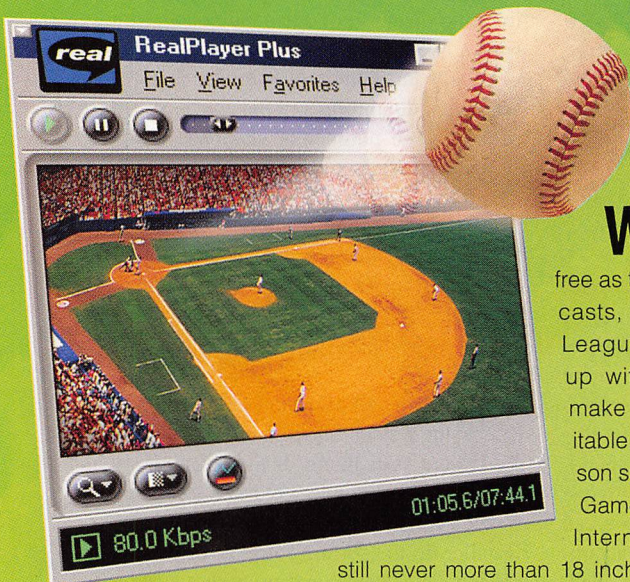
www.xantech.com, 818-362-0353



# Multimedia Maven

The newest equipment, software, and Web sites

EDITED BY MICHAEL ANTONOFF



## play ball

Web-based play by play was once as free as transistor-radio broadcasts, but this year Major League Baseball teamed up with RealNetworks to make pitches more profitable. With a \$9.95 season subscription to MLB's Gameday Audio on the Internet, your ears are

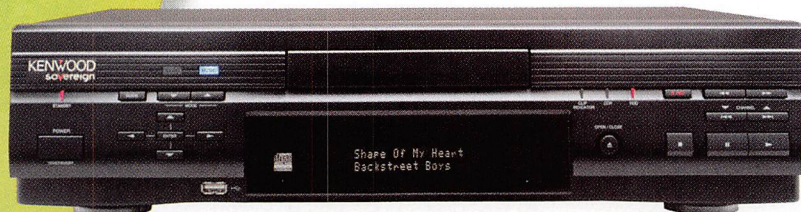
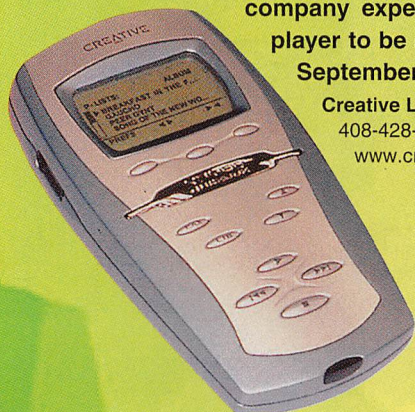
still never more than 18 inches away from the crack of a bat. You should be able to hear live and archived streaming audio for more than 2,000 games using RealPlayer 8 Basic software, which you *can* download for free.

MLB Radio [www.mlb.com](http://www.mlb.com)

## living small

Creative Labs designed the original Nomad Jukebox digital music player to be a dead ringer for a portable CD player, which has frustrated users who want to carry it in a shirt pocket. That changes with the next generation. Creative's Pocket Hard Drive (\$299) won't be much larger than its flash-memory players, yet it will hold between 6 and 10 gigabytes (GB) of compressed music! Final specifications weren't set at press time, but the company expects the new player to be available in September.

Creative Labs  
408-428-6600,  
[www.creative.com](http://www.creative.com)



## tasty entrée

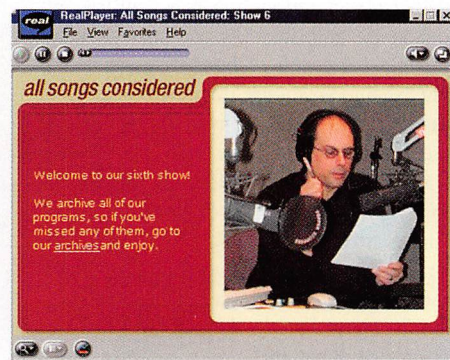
Putting a hard drive inside a CD player isn't new, but Kenwood's Sovereign Entré (\$1,800) is a lot more than a compressed-music jukebox. It's an entertainment hub that can operate a system of Sovereign components, including four new A/V receivers and two new 400-disc DVD megachangers. The OpenGlobe software (not exclusive to Kenwood) lets you create and select MP3 playlists from a menu on your TV screen, then stream multiple programs to different rooms over a Home PNA network using existing phone wiring. A front USB port makes it easy to transfer music to a portable. The Entré can burn CD-Rs or CD-RWs either with standard CD tracks from another CD player or with MP3 or WMA tracks from the 20-GB hard drive. It will be available in midsummer. **Kenwood** 800-536-9663, [www.kenwoodusa.com](http://www.kenwoodusa.com)

## beyond news

News junkies by definition don't get their minimum adult requirement of music. Enter *All Songs Considered*, a streaming audio program available only on the Web that offers extended versions of the musical selections heard ever so briefly between segments of National Public Radio's award-winning radio news program *All Things Considered*.

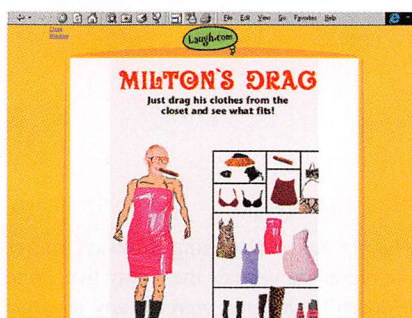
ATC's director, Bob Boilen (right), hosts the approximately 30-minute program with just enough erudite talk to introduce artists like the Penguin Café Orchestra and Moby. The audio is supplemented with a slide show. Although Net-delivered multimedia often demands a broadband connection, I had no trouble enjoying the show using a dial-up modem.

National Public Radio [www.npr.org](http://www.npr.org)





## jollies on demand



bound to break out laughing at some point. If not, there's always Milton Berle's drag page, where you, ah, drag women's clothing onto the comedian. Besides letting you play sample clips for free, the site sells comedy CDs.

Laugh.com [www.laugh.com](http://www.laugh.com)

## the m-files

If you're not ready for do-it-yourself DVD burning, or don't want to invest in the right equipment, consider the new a2DVD service from Sony's ImageStation Web site. Send in your edited camcorder tape and \$40, and they send back a disc. (Check the site for a list of DVD players that can play recordable DVD-R discs.) As they say in Hollywood, it's time to "repurpose" your movie. So why not your summer vacation? . . . Fashionable MP3 players that clip to your belt continue to arrive in time for summer. One of the coolest is Samsung's Mini Yepp (\$99, below). Only 2 1/4 inches long, it has 32 MB of embedded memory and comes with five songs preloaded. . . . MP3 players without removable memory offer the most megs for the money. DigMedia recently dropped the price of its SoulMate to \$89 with 48 MB and \$149 with 96 MB. Just don't try to insert a card. . . . Digisette has added voice recording to its latest cassette-shaped MP3 portable designed to play through a car or home tape deck. The built-in microphone on the Duo-64 E-Cassette (\$229, with 64 MB onboard (expandable to 128 MB), allows more than 5 hours of tapeless recording. No, you can't make the recording while it's inside a cassette deck.

### Sony ImageStation

[www.imagestation.com](http://www.imagestation.com)

**Samsung** 800-726-7864,

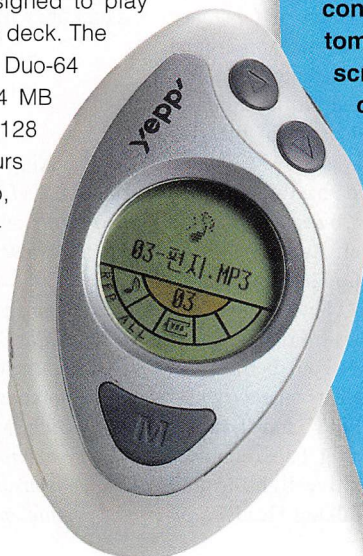
[www.samsungyepp.com](http://www.samsungyepp.com)

**DigMedia** 760-431-3500,

[www.digimedia.cc](http://www.digimedia.cc)

**Digisette** 973-455-7899,

[www.digisette.com](http://www.digisette.com)



## scan and run

How's this for a familiar scenario? You're entranced by a bounty of gorgeous technology at an electronics superstore, and you tell yourself that next time you're online you'll check out a particular company's Web site because its gear looks so cool. Back at your computer, you search the Web in increasing frustration as the manufacturer's name you thought you remembered disappears in a haze of "unknown domain" and "site not found" error messages.

Well, those days could be gone forever because Cross, the famous penmaker (you know, as in ink on paper), has teamed up with Digital:Convergence to produce the Cross:Convergence Pen. This electronics-packed ballpoint (\$90) allows you to scan standard product bar codes as well as Digital:Convergence "cues" printed in newspapers, magazines, and catalogs (see "Off the Air," January) anywhere you happen to see something you like. When you get home, you can upload the information to your PC running Windows 95 or higher (no Mac version yet) and jump straight to the relevant Web page without a search engine in sight.

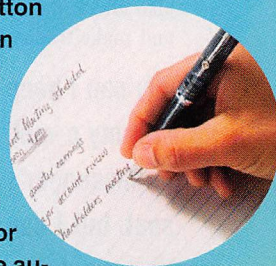
The scanning process is simple. A small button on the pen's side turns on the device, as shown by a thin red light. Slide the pen's top quickly over a bar code, and when the light turns green — this may take a few attempts — the code is in the pen's memory, which can hold 300 scans. You upload data to your computer by aligning the pen with a small optical sensor connected to the PC's serial port. The codes are automatically converted to names of companies, and they appear on-screen in the order they were scanned. When you double click on a company name, you're taken to its Web site in less than 30 seconds, assuming the Digital:Convergence software recognizes the bar code. If it doesn't, you're prompted to enter details about the manufacturer so it can be added to the database.

The technology is simple and effective, but, of course, it's only as good as the bar codes you scan (if you can find them), the breadth of the Digital:Convergence database, and the kind of information supplied at the destination Web sites. After scanning a jar of peanut butter, I found myself stuck on the Skippy page, where I was lured into making peanut-butter-and-banana cyber sandwiches and e-mailing them for fun. Such is the power (or misuse) of a scanning pen.

— Martin Bell

Cross 800-510-9660, [www.cross.com](http://www.cross.com)

Digital:Convergence [www.crq.com](http://www.crq.com)







# Summertime Views

Dear Sal,

Well, I promised that I'd write you when I got out on the road this summer, and that's literally what I'm doing right now. I'm sitting here in the passenger's seat of a sleek, roomy convertible blazing down the highway and writing you via the Internet hook-up in the dash. Wild, huh? I've got a keyboard in my lap, and I can see what I'm typing quite clearly on the 10-inch monitor installed in front of me. (Oh, and don't worry about any of this stuff distracting the missus, who's driving — the screen I'm using isn't visible to her. Safety comes first, after all.)

Anyhow, that's not all I can do in the car while we drive across the country and back. Not only am I able to keep up with my e-mail on this trip, but I can also check the latest stock quotes and make trades to keep my port-

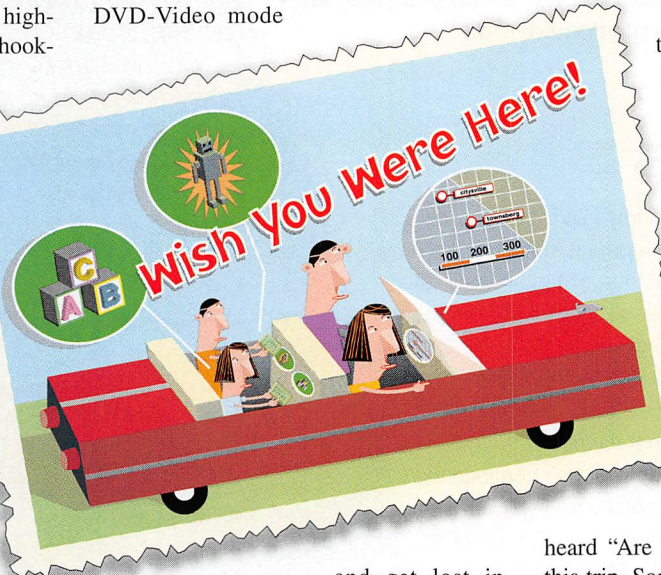
**Not only can I keep up with my e-mail from the passenger's seat, but I can manage my stocks and watch DVDs, too.**



folio from taking any further hits thanks to our fluctuating economy. I'm also taking care of my various writing assignments on the fly, as it were. (Now *there's* a double-edged virtual sword — unless I'm the one who's driving, I can no longer say, "Sorry, I can't turn anything in to you until I get off the road.") If we need destination information, I just switch over to the navigation option. We've got the latest DVD-based mapping/travel-help software slotted in the hide-away chassis mounted underneath the back seat. I used it earlier today to find a place to stop for lunch with home cooking instead of the usual blanderized beside-the-road fare. Yesterday it helped us find a better,

more direct route to one of our friend's houses. It probably shaved about 25 minutes off our initially projected arrival time, giving us more time to visit.

If I'm in an entertainment frame of mind, I switch the system over to the DVD-Video mode



and get lost in movies and concerts. There's no need to skimp on the sonics I'm used to with my home theater, by the way. The car has always been a natural environment for surround sound, and 5.1-channel setups are becoming more and more commonplace. This car's system does wonders for the special-edition DVD set of *Lawrence of Arabia* — the airplanes that buzz around in Chapter 11 had me ducking for cover. And don't get me started on the train derailment in Chapter 39 or all of the gorgeous desert location shots . . .

Concertwise, I've been having fun interacting with Pearl Jam's *Touring Band 2000* DVD. Not only does Jeff Ament and Matt Cameron's rhythm section kick some serious bottom end, but the viewing-angle options — roadie-eye views from all over the stage, the "Matt-cam" from behind the drum kit (which also selects a heavier percussion mix for "Even Flow" and "Evacuation") — keep it interesting. I also continue to marvel at the inventive lighting and stage presence in the Talking Heads' *Stop*

*Making Sense*. Watching it always makes me regret I never saw them play live. (And it doesn't make me regret it any less that the DVD's surround mix almost makes me feel I'm in the audience while I'm watching it.)

We haven't forgotten about the kids, either. In the back of both front-seat head rests, we've installed 5-inch monitors so they can play video-games or watch kiddie and educational videos to their (and our) hearts' content. They even listen on headphones. And since we designed each passenger area in the car as an individual entertainment zone, everybody can do his or her own thing without encroaching on anybody else's space.

In fact, I don't think I've heard "Are we there yet?" even once on this trip. Sometimes it's hard to get everybody *out* of the car once we reach our destination . . .

All right, my friend, I have to close for now. The missus is asking to trade places behind the wheel so she can move over to the passenger's seat and fire up the *Cast Away* DVD. I sure hope that's not meant as a hint or anything . . .

*Happy trails,  
Mike*

PS: Looking forward to watching a double bill of U2's *Popmart: Live from Mexico City* and *Rattle and Hum* next. I'll e-mail U my in-car review of them 2-morrow. **S&V**

*Last summer, Mike Mettler, editor in chief of Car Stereo Review's Mobile Entertainment, wished for DVDs of The Sopranos to enjoy while on vacation. Bada-bing! So he wants whoever's in charge to know that he'd love the entire two seasons of Twin Peaks on DVD, plus the prequel movie, Fire Walk with Me.*

ILLUSTRATION BY FRED RIX



What if I could  
CUSTOMIZE everything  
the way I customized  
my car's multimedia system?

EXHIBIT A: My family



CASE #59

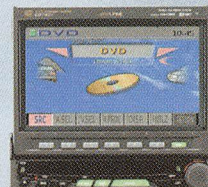


Steve Evans

Obviously, you can't choose your family. But once you get into your car the chance to pick and choose really opens up with Alpine's mobile multimedia packages. These are no ordinary systems off the rack. You practically build them yourself - adding only the components you want. So you can get directions from the navigation system, while people in the back watch football, play video games or put in a DVD movie. And that makes driving fun. Even long trips with the family.

PRODUCT:

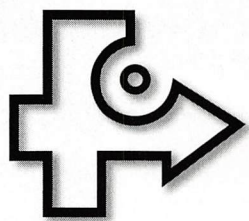
Mobile  
Multimedia  
Station™



1. Eliminate bogus fishing stories.
2. Replace nagging tendencies with ability to cook.
3. Replace.
4. Remove smart mouth. Insert smarter brain.
5. Remove tendency to bury underwear.

//////ALPINE®





# movies

## entertainment



### CLOSE ENCOUNTERS OF THE THIRD KIND

Columbia TriStar

Movie ★★★★★

DVD ★★★★★

It's hardly the kind of story that drives a classic Steven Spielberg adventure: boy meets spaceship, boy struggles to make a second date, boy lives happily ever after in space. No sharks, no dinosaurs, no Nazis to subdue. But *Close Encounters of the Third Kind* has endured thanks to its irresistible portrayal of human-alien contact and the sheer spectacle of its special effects.

Despite the phenomenal success of the original 1977 release, Spielberg has never stopped tinkering with his film. The version on this DVD is known as the Collector's Edition. Compared with the widely seen Special Edition, it restores some scenes from the original, deletes some Special Edition scenes, and ends up running five minutes longer. Confused? Don't be. The Collector's Edition is the finest version Spielberg has ever assembled. Let's just hope it's also the last — especially since all that re-editing still can't stop the movie's first half from dragging as our hero, Roy (Richard Dreyfuss), edges toward his third-kind encounter.

The movie seems a greater spectacle than ever on DVD. Image quality is limited by

the film stock and lighting techniques of the mid-1970s — especially compared with the sumptuous, state-of-the-art visuals Spielberg offhandedly generates today — but the THX-certified transfer makes the best of it. Douglas Trumbull's old-fashioned optical special effects remain the movie's biggest attraction, and they shimmer enticingly on disc. With its restrained mix (the emphasis is on the center channel), the Dolby Digital 5.1 soundtrack won't blow anyone away, but it is noticeably sharper and cleaner than the soundtracks of all previous versions.

A second disc serves up a fairly large package of extras. Included are a 102-minute documentary, a brief 1977 featurette that spotlights a hilariously youthful and goofy Spielberg, and 11 deleted scenes. The new material will please the diehards but won't make any new fans. At least the famous final scene inside the mothership, first seen in the Spe-

#### STAR SYSTEM

Stellar ★★★★★

Excellent ★★★★★

Good ★★★

Fair ★★

Poor ★

Movie refers to the original film.  
DVD refers to the film's presentation on disc, including picture and sound quality as well as extras.

cial Edition, is also included here. **English, Dolby Digital 5.1, DTS 5.1, and Dolby Surround; French and Spanish, Dolby Surround; letterboxed (2.35:1) and anamorphic wide-screen; two dual-layer discs.** Ken Korman

### BILLY ELLIOT

Universal

Movie ★★★★★ DVD ★★★★★

In 1984, British coalminers are waging a bitter, doomed strike. One miner's 11-year-old son, Billy, is primed for boxing lessons and the pit, but he discovers he's better at dancing. Supporting his talent and his dream is his determined, abrasive teacher (Julie Walters, who is marvelous). Opposing are his father and brother, who can't see past the fact that ballet is for "poofs."

*Billy Elliot* is part of a new subgenre of British comedy-drama (like *The Full Monty* and *Brassed Off*) in which unemployed industrial workers fight to regain their self-esteem. However, it carries a greater emotional kick because its hero is young enough to find his own new way. Director Stephen Daldry sidesteps the usual approach taken with such subjects — shooting ugly settings in gray light — and instead chooses sunlight and spaces that threaten to close in on our hero until he dances his way out of them. In the title role, Jamie Bell is amazing, both physical and emotional to exactly the right degree.

The best compliment I can pay the DVD is to say that I paid attention to the movie and not to its transfer, but the contrast, framing, and detail are fine, as is the sound. Extras are limited to production notes and a few stills in addition to the usual making-of featurette and trailer, but that shouldn't keep this from being a deservedly popular release. **English and French, Dolby Digital 5.1; letterboxed (1.85:1) and anamorphic wide-screen; single layer.** Sol Louis Siegel

### MISS CONGENIALITY

Warner

Movie ★★★ DVD ★★★★★

Sandra Bullock, who also produced this film, is cast as a rough-and-ready FBI agent who goes undercover as a beauty queen to root out a potential terrorist at a nationally televised pageant. Bullock does the Eliza Doolittle thing, converting from plain and frumpy to gorgeous and luscious, with the help of her gay trainer, the ever delightful Michael Caine. What could be vicious satire of just about everyone is tempered with affection; as in a good comic strip, barbs are thrown to amuse, not maim. And this is a very funny flick.



# Reference DVD

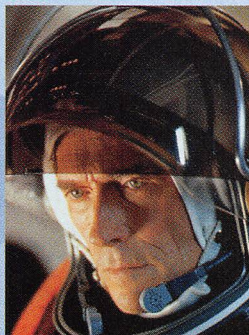
## SPACE COWBOYS

Warner

Movie ★★ ★ DVD ★★ ★ ★

**C**lint Eastwood shows us his lighter side in this story of Team Daedalus, would-be space pioneers whose moment of glory was thwarted when NASA replaced them with a chimpanzee astronaut. The manner in which they finally elbow their way into orbit 40 years later is pretty funny, but after an hour of old-guy jokes, you wish the cowboys would just blast off already.

Though the humor gets tired, the stunning 2.35:1 widescreen transfer vibrates with detail and dynamic color in almost every shot. The grizzled actors' flesh tones look natural from start to finish, and there's plen-



ty of punch to the blacks in both the scenes on earth and those in space. The soundtrack is mainly dialogue-driven, filled out on occasion with the room ambience of warehouse-like NASA facilities. The surround effects in some of the film's larger set pieces are certainly impressive, though, including a barnstorming biplane ride, a G-force simulator, and, ultimately, the cowboys' mission in space. Extras include a conversation with film editor Joel Cox and an expanded version of the film's *Tonight Show* se-

quence. **English and French, Dolby Digital 5.1; letterboxed (2.35:1) and anamorphic widescreen; dual layer.**

Al Griffin

The DVD transfer is rich in color and detail, and the Dolby Digital 5.1 soundtrack is done with more care than your average comedy. The disc contains two commentaries, one featuring Bullock and co-screenwriter Marc Lawrence laughing their way through the movie, the other with director Donald Petrie in a more serious mood. Other extras include two documentaries with funny outtakes, some deleted scenes, and a trailer. **English and French, Dolby Digital 5.1; French, Dolby Digital 5.1; letterboxed (1.85:1) and anamorphic widescreen; dual layer.**

Rad Bennett

## THE EMPEROR'S NEW GROOVE

Disney

Movie ★★ ★ DVD ★★ ★ ★

## THE ROAD TO EL DORADO

DreamWorks

Movie ★★ ★ DVD ★★ ★ ★

**T**wo lavish, animated films set in the fabulous cities of pre-Columbian peoples circa the 17th century? Truly, these are wondrous times! Not since the simultaneous release of two lambada movies, or the more or less identical *A Bug's Life* and *Antz*, have the twin film gods so generously smiled upon us.

*The Emperor's New Groove* is a very funny comedy about a smirky jungle potentate (voiced by David Spade) who gets turned into a llama by an evil witch (Eartha Kitt) and eventually learns the errors of his selfish ways with the help of a goodhearted peasant (John Goodman). *The Road to El Dorado* is essentially a Hope and Crosby road picture in which two lovable rogues (Kevin Kline and Kenneth Branagh) discover the titular lost city, get mistaken for gods, and try to make off with as much gold as they can carry before learning

the errors of their selfish ways with the help of a street-smart peasant (Rosie Perez, who's damned sexy, even if she is a cartoon). *Groove* probably has the higher laugh-per-minute ratio, but *El Dorado* has the funnier horse. The major difference between the two movies is in the songs, or lack thereof. Although it was originally conceived as a musical, *Groove* ended up with just two numbers, whereas *El Dorado* has what seems like hundreds of groan-inducers by über-hacks Elton John and Tim Rice.

The animation in each case is state of the art, with onscreen objects at times having enough apparent heft that you want to touch them. Thankfully, their artifact-free transfers are first-rate, with *El Dorado* having a slight edge. Both films have been blessed with splendid Dolby Digital and DTS 5.1 soundtracks.

Each disc contains extras galore, including commentaries, music videos, and games. The

two-disc Ultimate *Groove* set has in addition a behind-the-walls tour of Disney's feature animation department, following the creation of the film from development, story, and editorial to layout, backgrounds, animation, scanning, ink and paint, and music and sound. If you have kids, you can't go wrong with either of these DVDs. **Both: letterboxed (1.85:1) and anamorphic widescreen. *El Dorado*: English, Dolby Digital 5.1, DTS 5.1, and Dolby Surround; dual layer. *New Groove*: English, Dolby Digital and DTS 5.1; French, Dolby Digital 5.1; two dual-layer discs.**

Steve Simels

## NURSE BETTY

USA

Movie ★★ ★ ★ DVD ★★ ★ ★

**N**urse Betty, a Hollywood movie chock full of expensive stars but imbued with the soul of a daring independent film, wastes no time in shattering your preconceptions, whatever they may be. Renée Zellweger stars as a waitress in a greasy spoon in Kansas who's married to the most despicable husband to appear onscreen in years. When one of his shady business deals goes terribly wrong, Betty — engrossed by a tape of her favorite soap opera in a nearby room — inadvertently witnesses her husband's grisly execution. Immediately suffering "post-traumatic-stress syndrome," she forgets everything and sets off for Los Angeles to find her favorite soap actor, whom she now believes is really the doctor he plays (and her ex-fiancé). What could have been a horribly clichéd amnesia movie evolves into a rich meditation on the nature of fantasy and dreams thanks to a script that won an award at Cannes and to the deft touch of director Neil LaBute.

The virtually flawless DVD transfer beautifully preserves the careful compositions of

**Grassed off:** Nicola Blackwell and Jamie Bell in *Billy Elliot*





cinematographer Jean-Yves Escoffier. The disc comes with two commentaries as well as some deleted scenes. DVD-ROM-accessible extras include a shooting script and soap-opera episodes. **English, Dolby Digital 5.1 and Dolby Surround; letterboxed (2.35:1) and anamorphic widescreen; dual layer.** *Ken Korman*

## MARILYN MONROE: THE DIAMOND COLLECTION

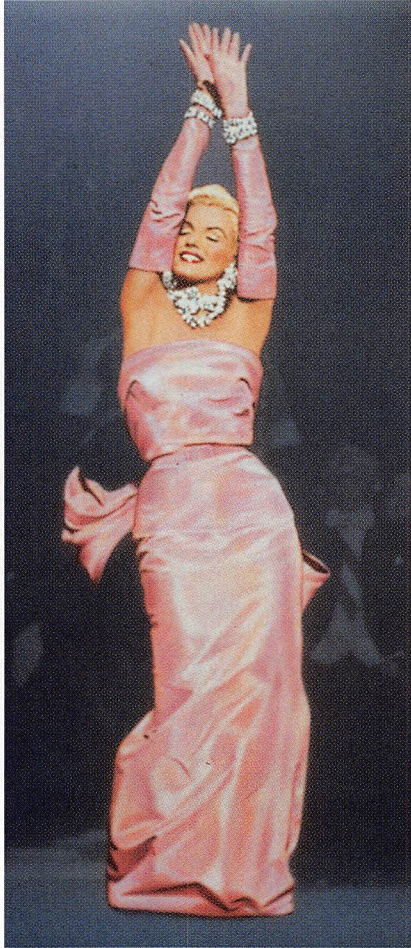
20th Century Fox

Movies ★★★★★ DVDs ★★★★★

**W**hy Marilyn Monroe? Given that wiser heads than mine — Norman Mailer's, for example — have weighed in on that subject at some length without much success, I wouldn't presume to try. However, anyone who ever enjoyed her work should be very glad that 20th Century Fox, without much fanfare, is offering up a major DVD restoration of five of her best and most representative films, along with a fascinating documentary about the uncompleted *Something's Got to Give* (1962), the project she was working on before her untimely death. These discs are available individually or as a boxed set.

Each film has been given a stunning picture and sound overhaul. The images are simply ravishing, and since each film comes with side-by-side restoration comparisons, you can see just how much better it looks than in its previous video incarnation. This is particularly true of *The Seven Year Itch* (1955); at last, Tom Ewell's baggy suit appears in its natural sky blue rather than an ugly green. *Itch, There's No Business Like Show Business* (1954), and *How to Marry a Millionaire* (1953) are making their widescreen video debuts, each with a 2.55:1 DVD transfer. *Bus Stop* (1956) also has a great CinemaScope 2.55:1 transfer. And

### Audrey in *Funny Face*



Marilyn in *Gentlemen Prefer Blondes*

the full-frame Technicolor picture of *Gentlemen Prefer Blondes* (1953) is a particular knockout. All films have three- or four-channel surround soundtracks, save for *Blondes*, which is in rather unconvincing stereo.

Each DVD contains interesting extras, including some amusing foreign trailers (I was especially taken with the Portuguese one for *Show Business*), newsreels like the famous Monroe/Jane Russell in-cement appearance at Grauman's Chinese Theater, and deleted takes such as the original, racier version of Monroe's famous subway-vent scene from *Itch*. The sixth DVD in the set — *Marilyn Monroe: The Final Days* — is the real find, however. Along with the making of *Something's Got to Give* and an interesting examination of the circumstances leading to Monroe's death, the documentary ends with a razor-sharp, fully edited cut of all the film's completed footage, comprising about a third of the script. On the evidence here, it wouldn't have been a particularly great movie — it's like the typical Rock Hudson/Doris Day vehicle — but Monroe, doomed or not, is vital and incandescent. If you're looking for clues as to what did her in, you won't find them here. **All: dual layer. *Show Business, Bus Stop, Itch, and Millionaire*: English, Dolby Digital stereo; letterboxed (2.55:1) and anamorphic widescreen. *Show Business*: English, Dolby Digital 4.0. *Millionaire*: English, Dolby Digital 4.0; French, Dolby Digital 2-channel mono. *Itch*: English, Dolby Digital 3.0; French, Dolby Digital 2-channel mono. *Blondes*: English, Dolby Digital stereo**

**and 2-channel mono; French, Dolby Digital 2-channel mono; full frame (1.33:1). *Bus Stop*: English, Dolby Digital 4.0; French, Dolby Digital 2-channel mono. *The Final Days*: English, Dolby Digital stereo; full frame (1.33:1). *Something's Got to Give*: English, Dolby Digital stereo; letterboxed (2.35:1) and anamorphic widescreen.** *Steve Simels*

## FINDING FORRESTER

Columbia TriStar

Movie ★★★★★ DVD ★★★★★

**W**ith *Finding Forrester*, Sean Connery gives one of the best performances of his career as a Pulitzer Prize-winning author who has become a recluse, never offering the world a second novel. His life intersects with that of a black 16-year-old who happens to be both a terrific basketball player and a writing whiz. Amidst the predictable bonding, mentoring, and platitudes, there are some very good observations on the writing process.

Equally revealing is the razor-sharp DVD transfer, which brings out details like a wire fence on an outdoor basketball court and the many articles in Connery's cluttered apartment. Color is good, and the Dolby Digital 5.1 mix is subtle but convincing. Sadly, the extras — two self-serving featurettes, some wisely deleted scenes, and a trailer for *Forrester* as well as ones for *First Knight*, *To Die For*, and *Fly Away Home* — are not worthy of the film. **English, Dolby Digital 5.1 and Dolby Surround; French, Dolby Surround; letterboxed (2.35:1) and anamorphic widescreen; dual layer.** *Rad Bennett*

## SABRINA

Movie ★★★★★ DVD ★★★★★

## FUNNY FACE

Movie ★★★★★ DVD ★★★★★

Paramount

**P**eople have always been charmed by the unique expression of heart, style, and beauty that was Audrey Hepburn, as if she were Mother Teresa and Princess Grace rolled into one. These two DVDs demonstrate different aspects of the performing talents that made Hepburn so much more.

In *Sabrina* (1954), a Cinderella tale set in the upper crust of Long Island society, Hepburn's dramatic ability is at the fore, her transformation from gamine to glamourpuss being quite astonishing. As the chauffeur's young daughter, her expression of a child-woman's first love and the crushing disappointment of unfulfillment is utterly convincing, conveying so much with so few words. And as the beguiling, sophisticated woman who returns from France, at ease with herself and her powers, she is equally authentic and delightful.

In *Funny Face* (1957), where she plays a beatnik who models in Paris in order to meet



## NEW FRENCH NEW WAVE

Intelligent, visually audacious, and thoroughly modern, the work of the current generation of filmmakers and actors in France has resulted in some of the best recent foreign films to be released on DVD. Growing out of the French New Wave of the late '50s and '60s but celebrating the country's whole cinematic heritage, this new generation brings a modernity in music, fashion, and attitudes — especially those concerning sexual fears and explorations — all conveyed with a fresh daring and excitement.

American films have also been dwelling on sex, but the focus is mostly on cheerleaders. The new French filmmakers seem more concerned with the psychology of the sex act itself, the loss of identity within sex, and the relationship of death to little deaths, especially in the age of AIDS. They examine the philosophy that our ideas toward sex reflect a new perspective — that of the woman. *Romance* (1999, Trimark), for example, has a heroine who, frustrated by an uninterested boyfriend, sets off exploring her sexuality through a series of casual encounters, particularly an S&M relationship. *An Affair of Love* (1999, New Line) deals with the sexual liaisons of two strangers in response to a classified ad placed by a woman who wants to have a fantasy fulfilled.

Some of the best of these explorations of the female psyche have come from director Benoît Jacquot. *The Disenchanted* (1990, First Run Features) has Judith Godrèche as a 17-year-old already disillusioned with sex after her boyfriend challenges her to sleep with the ugliest man she can find. *The School of Flesh* (1998, Columbia TriStar) stars Isabelle Hupert (who, like Catherine Deneuve, appears in most

French films released in the States) as an intelligent, middle-aged, middle-class woman who takes a young bisexual hustler as her kept lover. *A Single Girl* (1995, Fox Lorber), which introduced the radiant Virginie Ledoyen (wasted in *The Beach*), follows a pregnant girl through a day in which she starts a new job and must decide whether to have her baby with her boyfriend or alone. Ledoyen also appears in Olivier Ducastel and Jacques Martin-eau's *Jeanne and the Perfect Guy* (1998, Strand), an *Umbrellas of Cherbourg*-like musical in which a beautiful young woman with a string of lovers finally finds her perfect guy, who happens to be HIV-positive.



Jean-Marc Barr, Élodie Bouchez in *Don't Let Me Die on Sunday*

This focus on female protagonists has helped launch the careers of an astonishing number of extremely talented (and beautiful) young actresses. Many of them appear in Arnaud Desplechin's *My Sex Life, or How I Got into an Argument* (1996, Fox Lorber), in which a Truffautesque assistant professor of philosophy (Mathieu Amalric) ruminates on his life and sex, surrounded by a series of stunning women.

Perhaps the most gifted and fascinating of these actresses is the petite but powerful Élodie Bouchez, who made waves in Eric Zonca's *The Dreamlife of Angels* (1998, Columbia TriStar), winning the Best Actress Award at Cannes as well as the Oscar-like César playing a charming but unmotivated drifter. In Didier Le Pêcheur's *Don't Let Me Die on Sunday* (1998, First Run Features) she plays a club kid who O.D.s on bad Ecstasy and regains consciousness in a morgue after one of the workers accidentally revives her. Owing him her life,



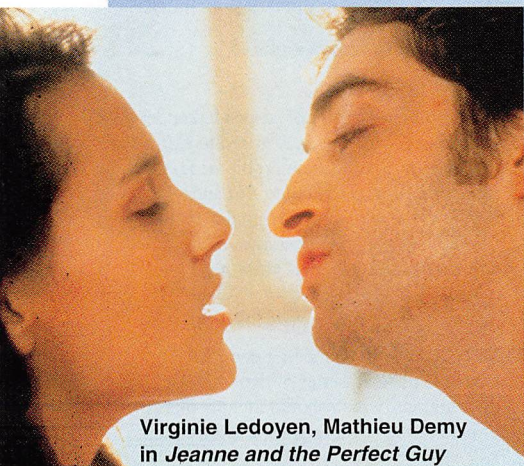
Nathalie Baye, Sergi Lopez in *An Affair of Love*

she follows him and his morgue-worker friends into their world of orgies, S&M clubs, and the search for greater contact with life.

The Gallic addiction to poetic realism, the tragic romanticism of living in the gutter but looking at the stars, has a new champion in the current bad boy of French cinema, Leos Carax. His first feature, *Boy Meets Girl* (1984, Fox Lorber), is a near-absurdist voyage of randomness in which a young man (Denis Lavant) conducts his life as a series of experiments. In *Bad Blood* (1986, Fox Lorber), Lavant is joined by Juliette Binoche in a cartoon-like heist movie filled with pulp-poetry pronouncements and strikingly original images in rich primary colors. And *Pola X* (1999, Fox Lorber) has a young successful author who, discovering he has a sister, abandons his wealthy background and inheritance to be her lover and search in the squalor for the true experience necessary to become a great writer. *Lovers on the Bridge* (1981, Miramax), a film containing some of the most ecstatically beautiful and purely cinematic sequences ever, was, incredibly, passed over for a DVD release.

These filmmakers, as well as the distribution companies putting out the films on DVD, seem to be technically savvy. Unlike many previous foreign-film releases, most of these discs contain beautiful transfers in their correct aspect ratios with decent soundtracks. All three Carax DVDs, for example, are high-quality releases, all anamorphic widescreen transfers. *Pola X* even has Dolby Digital 5.1 sound. *Boy Meets Girl* includes an interview with Carax, *Bad Blood* has another interview as well as outtakes, and *Pola X* has a commentary and great behind-the-scenes footage.

As the subject matter of these films is often risqué and sometimes quite graphic, it's unlikely that they'll be remade with Ted Danson or Nathan Lane. But if they should be, do yourself a favour and see the originals first. *Josef Krebs*



Virginie Ledoyen, Mathieu Demy in *Jeanne and the Perfect Guy*



# Quick Fixes

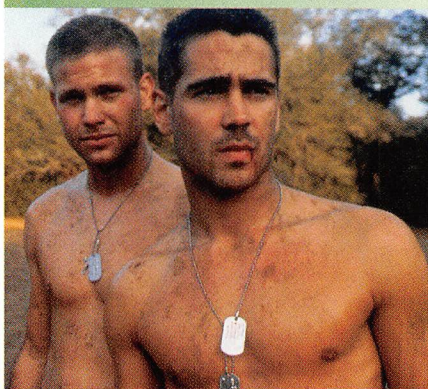
## TIGERLAND

20th Century Fox

Movie ★★★★★ DVD ★★★★★

In this drama of Army basic training set in 1971, directed with surprising economy (artistic and financial) by Joel Schumacher, a rebellious draftee (Bozz, played by Colin Farrell) keeps trying to get himself kicked out. When he fails, he works to save his friends from having to fight in Vietnam. The insanity of putting young men in a situation where the only objective is survival is brilliantly captured here, and Farrell has real screen presence. The DVD transfer copes well with the many darkly lit scenes, and extras include casting tapes, a making-of featurette, and a director's commentary. **English, Dolby Digital 5.1 and Dolby Surround; letterboxed (1.85:1) and anamorphic widescreen; dual layer.**

Sol Louis Siegel



**Tigerland:** Matthew Davis, Colin Farrell

## THE 5,000 FINGERS OF DR. T

Columbia TriStar

Movie ★★★★★ DVD ★★★★★

Dr. Seuss co-wrote this underappreciated and wildly imaginative gem from 1953 about a young boy and his evil piano teacher, and it's every bit as fresh and original as a literary classic like *Green Eggs and Ham*. Its striking Technicolor images virtually leap off the TV screen. Extras include the bonus cartoon "Gerald McBoing-Boing's Symphony" and a stills gallery. **English, French, and Spanish, Dolby Digital 2-channel mono; full frame (1.33:1); single layer.**

Ken Korman

## LITTLE NICKY

New Line

Movie ★★ DVD ★★★★★

Adam Sandler as the spawn of Satan — inspired conceit or deplorable typecasting? To be fair, this occasionally amusing demonic comedy is a lot better than other Sandler vehicles, like *The Waterboy* or *Big Daddy*, and there are enough genuinely funny folks around the margins (Harvey Keitel, Jon Lovitz, Rodney Dangerfield) to distract you from his annoying shtick. Fitfully interesting bonuses include a heavy-metal documentary (*Satan's Top Forty*, starring Gene Simmons and Ozzy Osborne), deleted scenes, a cast commentary, and a DVD-ROM script-to-screen feature. **English, Dolby Digital 5.1 and Dolby Surround; letterboxed (1.85:1) and anamorphic widescreen; dual layer.**

Steve Simels

## THE YARDS

Miramax

Movie ★★★★★ DVD ★★★★★

Gritty, super-realistic, and refreshingly cynical, writer/director James Gray's tale of Big Apple corruption and betrayal is a long-overdue extended middle finger to Mayor Giuliani-era boosterism — as well as a fabulous throwback to the sort of smart, socially conscious '70s films we normally associate with Sidney Lumet. The amazing cast helps (Mark Wahlberg, James Caan, Joaquin Phoenix, Ellen Burstyn, Faye Dunaway, and Charlize Theron), but this is mostly Gray's show. The DVD transfer does full justice to his painterly visuals, and even his commentary is gripping. **English, Dolby Digital 5.1; French, Dolby Surround; letterboxed (2.35:1) and anamorphic widescreen; single layer.**

Steve Simels

## MEN OF HONOR

20th Century Fox

Movie ★★★★★ DVD ★★★★★

This uplifting, old-fashioned biography, based on the real life of Carl Brashear, stars Cuba Gooding, Jr., as a black sailor who rises above both racism and a devastating physical disability to achieve his dream of becoming a U.S. Navy Master Diver. The DVD looks and sounds excellent, and the extras are above average. They include a commentary and deleted scenes as well as an animated storyboarded sequence. **English, Dolby Digital 5.1 and Dolby Surround; French, Dolby Surround; letterboxed (2.35:1) and anamorphic widescreen; dual layer.**

Rad Bennett

## CIRCUS

Columbia TriStar

Movie ★★★★★ DVD ★★★★★

A quirky, violent, and deliberately Tarantino-esque crime thriller, this realistic tale has small-time Brit crooks conning everyone in sight. The film benefits from amusing dialogue and an ace cast. Modest extras include deleted scenes and a fairly interesting making-of featurette. **English, Dolby Digital 5.1 and Dolby Surround; French, Dolby Surround; letterboxed (1.85:1) and anamorphic widescreen; dual layer.**

Steve Simels

## 12 ANGRY MEN

MGM

Movie ★★★★★ DVD ★★★★★

This 1957 big-screen adaptation of Reginald Rose's classic teleplay, while basically filmed on a single set, remains one of director Sidney Lumet's most cinematic efforts. Credit Boris Kaufman's inventive camera, whose blistering monochrome will make you feel the jury-room heat and humidity of a New York summer. Previously shown cropped to a mere 9½ angry men, this crisp widescreen transfer finally allows collectors to study the formidable ensemble cast in toto. **English and French, Dolby Digital 2-channel mono; letterboxed (1.66:1) and anamorphic widescreen; single layer.**

Mel Neuhaus

her guru in existentialist Montmartre, Hepburn's considerable musical gifts are on display. Though her voice didn't prove strong enough for *My Fair Lady*, it is perfect for George and Ira Gershwin's tender songs. She's also a wonderfully expressive hooper, holding her own even with co-star Fred Astaire.

The DVD transfer of *Sabrina*, though somewhat grainy, is otherwise clear and bright, with plentiful detail and nice contrast. Sound is good, clean mono. *Funny Face* also has a restored mono soundtrack in addition to a 5.1-channel remix that fills out the musical numbers. Its picture transfer is nothing short of terrific. The only fault is flecking at reel changes. Because the film is about fashion photography, the colors in each shot are purposely arranged like elements in a fashion spread, and they pop beautifully. Director Stanley Donen used every inch of his widescreen frame — sometimes with triple-split screens — to create graphic designs and spatial expressions of relationships. Pan-and-scan this film, and you lose half the meaning and pleasure. **Both: English and French, Dolby Digital 2-channel mono; dual layer. Funny Face: English and French, Dolby Digital 5.1; letterboxed (1.85:1) and anamorphic widescreen. Sabrina: full frame (1.33:1).**

Josef Krebs

TIP  
Sheet

## Coming Releases

### DRACULA 2000

Undead dudes and bitchin', bitin' babes. DVD includes deleted scenes, audition reels, storyboards, and a commentary. Dimension, July



### BRIAN DEPALMA TRIO

Three from the master of suspended understatement — *Blow Out*, *Dressed to Kill*, and *Carrie* — all in anamorphic widescreen transfers. *Dressed to Kill* and *Carrie* come with Dolby Digital 5.1 soundtracks, multiple documentaries, and animated photo galleries. MGM, Aug.

### SNOW WHITE AND THE SEVEN DWARFS

*Snow White* will be the first entry in Disney's planned series of two-disc editions, which should include plenty of behind-the-scenes extras. Disney, Oct.



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In the same way that the Warner Music Group is spearheading DVD-Audio, Sony Music is leading the charge for Super Audio CD — though that's a little difficult to tell from Sony's first batch of surround SACDs, which number exactly two. Yes, the company has been releasing stereo SACDs for some time now, but it was beaten to the multichannel punch by several other labels — most notably by Virgin U.K., whose reissue of Mike Oldfield's *Tubular Bells* earned high marks in our April issue. And although Sony was hoping to have ten surround SACDs ready from the likes of Miles Davis, Billy Joel, Jeff Beck, and Celine Dion, they didn't make our deadline (though they may be in stores by the time you read this).

Of the two discs that did make it, one features the violinist Midori and is reviewed by Robert Ripps in his roundup of classical SACDs, immediately following. The other disc, on the Columbia label, is **James Taylor's** *Hourglass* (Music ★★★★★, Recording ★★★★★). Listen carefully and you'll get a sense of the clarity, depth, air, and overall naturalness touted by supporters of SACD's Direct Stream Digital technology. You'll also hear a beautiful six-channel mix by Frank Filipetti, the original album's engineer, mixer, and co-producer. Taylor's lead vocals are rich and prominent in the center channel. Background vocals aren't overdone in the back. The subwoofer level is perfect for this kind of acoustic music. And Filipetti gives a textbook example of how to use the surround channels subtly but effectively, filling them nicely when the song calls for it but reserving them for ambience when just ambience will do. There are two instances where he uses percussion dramatically in the surrounds, but I won't give them away, since they refer specifically to the subject matter. Get out the booklet of lyrics and follow along.

You won't find the lyrics on your TV screen because, although SACD is capable of carrying video content, none of the discs reviewed here includes any. Not that visuals

would appreciably help two entries from the audiophile label dmp, the **Vivino Brothers' Blues Band** (Music ★★★, Recording ★★★★★) and the **Bob Mintzer Big Band's** *Homage to Count Basie* (Music ★★★★★, Recording ★★★★★). Each is just a four-channel mix — which isn't necessarily a bad thing (the excellent *Tubular Bells* is a four-channel disc, after all). But these are unremarkable mixes; in fact, they're textbook examples of how reserving the surround channels for just ambience will sometimes not do. As Robert Ripps notes below, dmp does

rolling around multichannel demo rooms like a marble stuck in a ship's overhead. May we all have smoother sailing with James Taylor and other surround SACDs yet to come.

Ken Richardson

The launch of classical music on multichannel SACD is impressive for its wide range of musical styles, from 16th-century English sacred choral music to 21st-century percussion ensemble. It's also worth noting that the acoustic environments captured here (with varying degrees of success) include the concert hall, the church, and the battlefield.

Somewhat surprisingly, given the parent company's involvement in the development of SACD, Sony Classical's

first multichannel entry is not one that is likely to draw much attention to the format. It's a perfectly decent recording of two works by **Mozart** (Performance ★★★★★, Recording ★★★★★). The Sinfonia Concertante in E-flat has fine playing by violinist Midori, violist Nobuko Imai, and the NDR Symphony Orchestra of Hamburg conducted by Christoph Eschenbach. He doubles at the keyboard for the second work, the Concerto in D for Violin and Piano. While much is made in the program notes of the higher-than-usual tuning of the viola in this recording, the result is still a rather traditional-sounding and, by today's standards, somewhat heavy-handed approach to Mozart. The six-channel surround mix creates a natural concert-hall ambience

— orchestra across the front, the soloists split front left and right, and the surround channels used sparingly — but in the concerto, the piano is somewhat muddy and overly resonant.

Telarc's first surround SACD is unlikely to be ignored. By choosing the **1812 Overture** — a sonic crowd-pleaser that has long challenged recording engineers — as the focus of its disc of Tchaikovsky selections,

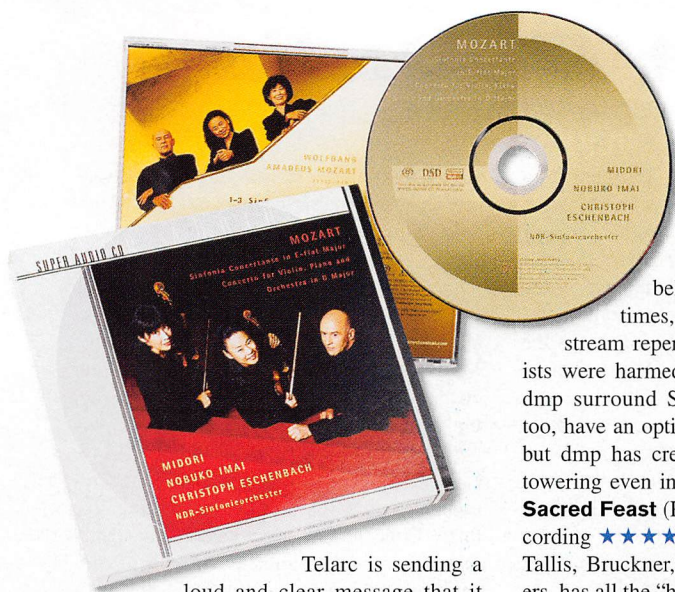


## SACD's Surround Overtures

much better with its choral entry, *Sacred Feast*. But here, it seems to be going through the multichannel motions.

Finally, with their Supersonic/BMG import *Don't Give Me Names* (Music ★★, Recording ★★★★★), I give you the **Guano Apes** — and you can have 'em. How these pedestrian German alt-rockers got the green light to make this heavy-breathing six-channel SACD is a mystery. The disc has been





Telarc is sending a loud and clear message that it means business. And I meant business, too, in my efforts to determine the disc's level of success. With the assistance of the editors at **Sound & Vision**, those efforts involved three listening rooms, three surround systems, and three multichannel SACD players — in fact, *all three* multichannel players then in production. And while the sonic experience improved somewhat through a reference system including B&W Nautilus 803s for the front left and right speakers and a 15-inch B&W subwoofer, all in all this recording by the Cincinnati Pops Orchestra under Erich Kunzel was disappointing (Performance ★★, Recording ★★★).

The cannons and bells may thrill fans of this stirring piece, but there is *music*, too — and when it is effectively performed, it creates the emotional atmosphere that makes those sonic effects meaningful and truly spectacular. Here and elsewhere (in the polonaise and the waltz from *Eugene Onegin*, the Cossack Dance from *Mazeppa*, the *Capriccio Italien*, the *Marche Slave*, and the *Festival Coronation March*), the music all too often falls flat. Telarc has opted for the use of a chorus in the *1812*, both for the opening hymn “God Preserve Thy People” (Kiev Symphony Chorus) and later on (Children’s Choir of Greater Cincinnati), and whether or not this addition is preferable to the original version, the choruses perform well and are nicely recorded. But the orchestral sound seems compressed and is burdened by overprominent bass. Following Telarc’s warning to set a “safe level” for the volume because of the cannons, it’s impossible to reach an acceptable level for enjoyment of the actual music. The bells get lost in the din and never achieve their effect. And even the cannons, while realistic, fail to be truly exciting. Perhaps the use of the recommended but optional “height channel” would have helped, but for most listeners, mounting one or two *additional* speakers *overhead* is an impractical solution.

Meanwhile, the dmp label demonstrates that, sometimes, less can be more. No mainstream repertory, no orchestra, no soloists were harmed in the making of the two dmp surround SACDs I auditioned. They, too, have an optional “overhead channel” — but dmp has created recordings that sound towering even in normal surround playback. **Sacred Feast** (Performance ★★★★★, Recording ★★★★★), heavenly choral works by Tallis, Bruckner, and Messiaen, among others, has all the “height” you could ask for in a church setting. Not only does the music seem to float in a high space, but it also has depth, warmth, and brilliance. The Gaudeamus choir and its director, Paul Halley, give us a thoughtfully chosen, beautifully executed program.

Very different musically, and almost as satisfying sonically, is **Far More Drums** by the Robert Hohner Percussion Ensemble (Performance ★★★★★, Recording ★★★★★). In a collection that includes percussion works influenced by music from Haiti, Ghana, Hawaii, Bali, and Japan as well as new pieces by American composers Christopher Rouse and Russell Peck, dmp again demonstrates just how effective a surround SACD can be when engineering expertise is matched to musical daring.

Finally, from Delos, comes a disc that is daring in its own way. For its first multichannel SACD, the label has chosen relatively unfamiliar works by two 20th-century Russian composers: **Shostakovich**, represented by his Chamber Symphony, and **Schnittke**, heard in his Concerto for Piano and Strings. Both are

performed by the Moscow Chamber Orchestra with Constantine Orbelian as pianist and conductor (Performance ★★★★★, Recording ★★★★★). These are challenging works “dedicated to victims of war and terror,” and they are given thoughtful, very persuasive performances. The concert-hall ambience seems just right, with surround sound that is satisfying without drawing undue attention to itself. If the piano’s lower tones seem a bit muddy, its center-speaker placement is nonetheless excellent.

Robert Rippes

## RADIOHEAD *Amnesiac* Capitol

Music ★★★★★ Recording ★★★★★

**S**hould listeners who were dumbstruck by stretches of *Kid A* take heart in the rumors that the follow-up CD, *Amnesiac*, gathers the “more accessible” material from the same recording sessions?

No.

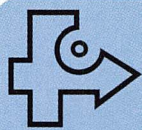
The rumors were false. Radiohead has pieced together an album that’s just like *Kid A* but not really. The first song, “Packt Like Sardines in a Crushd Tin Box” (all misspellings intentional), has the same electronic feel as *Kid A*’s opener, “Everything in Its Right Place.” Similarly, “Pull Pulk Revolving Doors” recalls the distortions of “Kid A” itself — but here, the effect is much more static (and closer to filler). Elsewhere, the repeated guitar riff of “I Might Be Wrong” parallels the repeated bass riff of “The National Anthem,” except nothing drops in for dramatic counterpoint like the horns did last time out. There’s even an actual reappearance of a *Kid A* song, “Morning Bell,” with drums replaced by a shower of shimmer — neat, but a B-side nevertheless. And there’s one selection here, “Knives Out,” that in its ethereal guitars and moody chord progression sounds too much like . . . Radiohead?

All of which is not to say that *Amnesiac* is a failure — far from it. But it’s a disappointment coming after three groundbreaking albums in a row. Indeed, listening to *Kid A* in retrospect confirms how thoughtfully that album was put together. Yet *Amnesiac* rides high on three songs. “Packt Like Sardines” is tantalizingly beautiful. “Life in a

Glasshouse” summons all those “National Anthem” horns for a completely different honk, sounding like the morning after Mardi Gras. And then there’s “Pyramid Song,” where a haunting, intoxicating melody line on grand piano stumbles across the room with







# Tracking DVD-Audio

**T**here's a great scene in the movie *Time After Time* where H. G. Wells and Jack the Ripper, whisked to the future in a time machine, square off in a modern-day hotel room. "I want you to come with me now," says Wells. "I am obliged to take you back. . . . We don't belong here."

"We? Don't belong here?" Jack grabs the TV remote and switches to various scenes of violence. "On the contrary, Herbert, I belong here completely and utterly. . . . The world has caught up with me and surpassed me."

A couple of modern-day producers, Bob

round is just right. As you're assaulted from all corners, you'll happily surrender to the sonic delirium. You'll also enjoy the song's accompanying video, which predates Queen's "Bohemian Rhapsody" by a full two years. Other bonuses include some nice audio interview snippets (Alice speaks!) and five of the ten live tracks from Rhino's Deluxe Edition CD (Alice loses his voice!).

Unfortunately, there are no extras on the Metallica disc except for a quick preview of the record's coming installment in the *Classic Albums* video series. (Of course, it would have made perfect sense to put a big chunk of that program right here on this DVD-A — but I can dream, can't I?) Nevertheless, the awesome six-channel mix leaves you wanting for *nothing*. Ably assisted by engineer/mixer Randy Staub, Rock drops you into the studio so that you can feel the impact of guitars, bass, and drums (especially drums). Listen to "Wherever I May Roam" for some thrilling, flexible use of the surround channels. And if you think a metal album can't possibly show off the attractions of DVD-Audio, think again. The crispness of the guitar scrapes, the depth of the drum hits —

these tout the format as well as anything else. And with entries as successful as *Billion Dollar Babies* and *Metallica*, wouldn't it be ironic if "mere" hard-rock albums helped drive the sales of a theoretically audiophile format?

Of course, the Warner Music Group taps other genres in its strong lineup of titles this month. Especially interesting is Giant's reissue of **Steely Dan's** *Two Against Nature* (Music ★★★★★, Recording ★★★★★) — not because this record won the Grammy for Album of the Year, nor because this music is tailor-made for DVD-Audio. Rather, it's interesting because the remixer here is the notorious Elliot Scheiner — and he keeps his wilder six-channel tendencies in check, for the most part. Yes, he puts too much percussion in the surround channels for the title track, and Donald Fagen's keyboard chords nag me from behind in "Cousin Dupree." But overall, this a good job — and certainly better than Scheiner's mix for the live *Two Against Nature* DVD-Video. No extras, though, except some photos — which you can't even view while listening.

When it comes to the song cycle that is **Joni Mitchell's** *Both Sides Now* (Music ★★★★★, Recording ★★★★★), I must say that, musically, I agree with Richard C. Walls's original evaluation of the Reprise CD in these

pages: too much orchestra, not enough variety. That said, the six-channel mix by original co-producer Larry Klein and original mixer Allen Sides lends a remarkable richness to that orchestra. There's also fine detail, as you can hear in the resolution of woodwinds, piano, and drums in "Sometimes I'm Happy." Mitchell herself is primarily in the center channel — a gutsy move considering her aging voice, but it works nonetheless, helping her hold her own against the strings. As for extras, the "biography" here is just a record-company plug for the album, starting like this: "Conceptually breathtaking, brilliantly realized, lovingly crafted by an artist of consummate intelligence and unerring instincts, *Both Sides Now* is among the most surprising and fulfilling albums in Joni Mitchell's altogether surprising and fulfilling career." Down, flack, down!

Also from Reprise comes the self-titled debut of **Take 6** (Music ★★★★★, Recording ★★★★★), which does for a *cappella* vocals what *Buena Vista Social Club* and Béla Fleck's *The Bluegrass Sessions* did for acoustic instruments. It's hard to find fault with Jack Nicely's mix, which plants you in the middle of this gospel/jazz lovefest. It's easier to find fault with — *again* — the extras. "About Take 6" is a weak bio. And the two "bonus tracks" are actually (and incongruously) taken from later albums.

The one non-Warner title this month is **Peter Buffett's** soundtrack for the documentary film *Triathlon* (Music ★★★★★, Recording ★★★★★), released on his own label, Bison-Head. It has a great big extra: hypnotic "G-Force" visuals intended to accompany the entire album, developed by a digital artist/engineer. Both the music and the mix are big, too, and the result is better than Buffett's

early New Age pieces, but it sounds a little bit like Blue Man Group Lite.

Ken Richardson



Ezrin and Bob Rock, must have felt that way when they started remixing their work for DVD-Audio.

Say what?

You see, Ezrin made his name by creating theatrical recordings for Alice Cooper. And Rock, producing a certain "Black Album" for a certain metal act, stated at the time that he was out to make the heaviest recording ever heard. But both producers could take the LP and the CD only so far. Enter DVD-Audio. At last, technology catches up to what Ezrin and Rock have always heard in their heads — and you can hear the often amazing results on **Alice Cooper's** *Billion Dollar Babies* (Music ★★★★★, Recording ★★★★★) and the self-titled **Metallica** (Music ★★★★★, Recording ★★★★★) from Warner Archives/Rhino and Elektra, respectively.

For the six-channel *Babies* remix, Ezrin was assisted by Ken Caillat and Gary Lux, on loan from the 5.1 Entertainment Group — and this is some of the best surround work those two folks have ever been associated with. True, not everything works; the title track actually loses punch by having its elements thrown around the soundstage. But "Hello Hooray" is a gas, with appropriately big ambience giving the track the majesty it always needed. And "Elected" is even better. Indeed, here's a case where over-the-top sur-





drums and strings. It's an absolute classic — even if lyricist Thom Yorke should stop jumping in rivers already. *Ken Richardson*

## LUCINDA WILLIAMS

### Essence

#### Lost Highway

Music ★★★ Recording ★★★

If you've heard great things about Lucinda Williams and figure it's time to check her out, *Essence* is not where you'll want to jump in. That would be 1998's *Car Wheels on a Gravel Road*, her signature recording to date. By comparison with that feisty album, which was like a rollicking tour of the emotional backroads of the Deep South by moonlight on moonshine, *Essence* is more of a brooding, maundering work that mostly, sad to say, spins its wheels.

Williams sings of lonely girls and broken butterflies, her voice colored blue and her mood largely downbeat. A steady trickle of musical teardrops springs from songs like the violin-kissed "Blue" ("I just wanna go back to blue," she sings, as if inured to depression) and "Reason to Cry" (a plaintive ode to dashed dreams that asserts, "When nothing makes any sense / You've got a reason to cry"). Williams rouses herself from the doldrums only in "Get Right with God," a swamp gospel number about the lengths to which she'd go "if I could walk righteously again." By and large, though, *Essence* is a late-night, bawl-in-your-beer album on which Williams seems to have lost some of her fight.

*Parke Puterbaugh*

## BRUCE SPRINGSTEEN & THE E STREET BAND

### Live in New York City

#### Columbia

Music ★★★★★ Recording ★★★★★

Bruce Springsteen has never sung with such unbridled passion and range. On the two-CD *Live in New York City*, he slips into a transcending falsetto here and a raging bellow there. The key performances are "Two Hearts" and "Land of Hope and Dreams," which, respectively, interpolate Marvin Gaye and Tammi Terrell's "It Takes Two" and insinuate Curtis Mayfield's "People Get Ready," classic soul songs about earthly love and spiritual redemption. In between comes the difficult stuff: songs of tough times in hard towns ("Atlantic City," "Youngstown") and songs about darkness on the edge of the runaway American dream ("Murder Incorporated," "Badlands"). Finally, there's "American Skin (41 Shots)," the news-making broadside about the overkill of an innocent man by New York City cops. At once anger-filled and heartbroken that we could live in a country where such a thing could happen, it is Spring-

steen's most important song since "Born in the U.S.A."

The album is raw and unmistakably live. Voices, especially those of Springsteen and Stevie Van Zandt, tangle not so much in perfect harmony but in a messy affirmation of brotherhood. Clarence Clemons's sax seems a mite sickly in his "Prove It All Night" solo, but the Big Man comes through in "Out in the Street" and "Tenth Avenue Freeze-Out." The latter anthem works fine until Springsteen goes completely over the top, bordering on self-caricature with his drawn-out band introductions. Still, it's a pardonable moment of excess on a galvanic album that seeks with every ounce of energy to answer the question, posed at several points by a raw-throated Springsteen, "Is there anybody really alive?"

A batch of "six additional performances" includes a radical 12-string acoustic remake of "Born in the U.S.A.," 11 searing minutes of "Jungleland," and the touching finale "If I Should Fall Behind." Also, added to the end of Disc 1 at the last minute and therefore unlisted is a faithful version of "Born to Run."

*Parke Puterbaugh*

## R.E.M. Reveal

### Warner Bros.

Music ★★★★★ Recording ★★★★★

One of the biggest complaints about R.E.M.'s last album, *Up*, was that it was just too diffuse to get a handle on. But nobody can say that about *Reveal*, which ranks with *Automatic for the People* and *Monster* (neither of which it much resembles) as one of the band's most unified albums. From the warm wash of sound in the opener, "The Lifting," you can tell exactly where this one is going: the band apparently came up with a mood so gorgeous that it needed to sustain it for an entire album.

That's *Reveal*'s strength — as well as its drawback. After casting in a few directions on *Up*, R.E.M. has settled on its post-Bill Berry sound: layers of keyboards, quiet drums, gently chiming guitars, subtle electronics, and rich melodies. Add to that some of Michael Stipe's loveliest vocals, and the result is a purposely uplifting album that avoids cheap



Lucinda Williams, skulking around

sentiment. There are no real rockers, but you get a nicely oddball finale (the lounge-ish "Beachball") and a better *Pet Sounds* homage ("Summer Turns to High") than the last album's "At My Most Beautiful."

The obvious problem is that almost nobody can get away with 12 longish, mid-tempo songs on the same disc. And *Reveal* could really use just one change of pace — especially since the live version of "She Just Wants to Be" (which hit Napster in January) sounded like a classic R.E.M. rocker. Here, it's just one in a string of lush, ethereal tracks. So, take *Reveal* in small doses until it sinks in. At the very least, R.E.M.'s experimental period is proving more rewarding than Neil Young's or Elvis Costello's. *Brett Milano*

## THE ELECTRIC LIGHT ORCHESTRA Zoom

### Epic

Music ★★★★★ Recording ★★★★★

### Eldorado

#### Epic/Legacy

Music ★★★★★ Recording ★★★★★

Don't be fooled by the packaging or promotion. *Zoom* is not an ELO album. No operatic soundscapes or swirling strings here. Instead, this is a solo album by band founder and chief everything Jeff Lynne with the ELO tag slapped on after the fact — which is in no way a criticism. Sometimes subtle, often powerful, and even occasionally soulful, *Zoom* is more than worth a listen. Before you do listen, though, you need to adjust — but not lower — your expectations.

ELO's albums were famous for their stu-

## STAR SYSTEM

Stellar	★★★★★
Excellent	★★★★
Good	★★★
Fair	★★
Poor	★

Music refers to content alone.

Recording refers to sound quality and, where applicable, multichannel mix.



dio sheen, but *Zoom* has a thick, homebrew, even unrefined sound that comes from Lynne's playing practically every instrument. (George Harrison and Ringo Starr sit in occasionally.) Then there are the guitars. In the old days, Lynne was notorious for downplaying the rock instrument. But you'll find more guitar solos here — and some pretty juicy ones, too — than in ELO's entire collected works.

*Zoom* is a well-wrought succession of pop recordings, each with its own beguiling style. The best track here is the last, "Lonesome Lullaby." Lynne's past homages to the Beatles have ranged from deftly engaging to downright embarrassing, but this one takes Lennon's "Cry Baby Cry" and builds a whole new edifice atop it as worthy as its predecessor.

Meanwhile, Lynne has overseen a fresh remastering of *Eldorado*, arguably ELO's best album. The result is a big improvement over the record's previous CD incarnations — with the exception of Steve Hoffman's benchmark 1993 remastering for DCC Compact Classics. This new version comes close to matching Hoffman's, but it just doesn't have the same detail and openness. It does have a fine bonus track, however: an *Eldorado* suite apparently cobbled together out of pristine-sounding orchestral and band cues from the original sessions.

Michael Gaughn

## QUICK FIXES

### TRAIN Drops of Jupiter

Columbia

Music ★★ Recording ★★★★★

Train is rock's Little Engine That Could, getting where it's going with solid songs and minimal flash. The band unveils an instant arena sing-along in the tuneful, midtempo title song before tearing up the tracks in "Respect," which rocks harder than this cerebral, Americana-inclined band seemed capable of. Even the cerebral stuff is nice, too, particularly the dreamy, country-flavored "Let It Roll."

Parke Puterbaugh

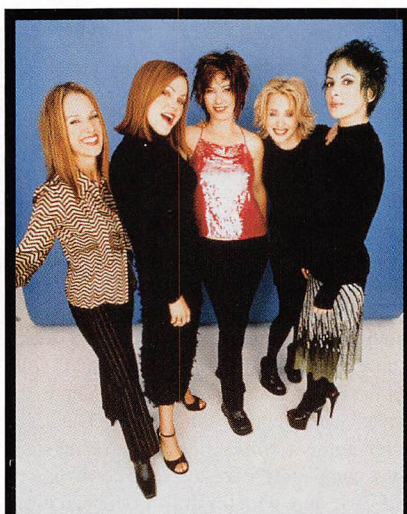
### IAN HUNTER Rant

Fuel 2000

Music ★★ Recording ★★★★★

This is easily Hunter's best album in more than a decade, and not just because it's also his only U.S. album in more than a decade. There's everything from mandolins to drum machines to love ballads to a mini punk opera ("Morons") in the style of Mott the Hoople's "Marionette." But it all hangs together in a semi-concept album about his estrangement from England — and about getting older and not quieting down. "Still Love Rock and Roll," indeed.

Brett Milano



### Bring home a couple of five-packs: Blues Traveler below, Go-Go's on top

well-engineered recording from Dawn Upshaw and her longtime partners at Nonesuch is always welcome amidst the dross and the overhyped. Bach's sacred Cantata No. 199, an inner monologue that Upshaw raises to a dramatic climax, is surrounded by Purcell's vivid text settings, ranging from the blissful *Music for a While* to the passionate *The Blessed Virgin's Expostulation*. The excellent instrumental accompaniment adds to the pleasure of this thoroughly satisfying recording.

Robert Rippes



### CHRIS POTTER Gratitude

Verve

Music ★★ Recording ★★★★★

Saxophonist Potter has conceived this quartet session as a tribute to those pantheon players — from Lester Young to Eddie Harris to John Coltrane — who have influenced him the most. Each of the ten originals and three covers included here manages to reference a specifically famous approach before going on to feature one of Potter's typically probing statements. It's a good lesson on how to access the past without submerging your identity, as well as a fine display of this still young player's authoritative style.

Richard C. Walls

### BLUES TRAVELER Bridge

A&M

Music ★★ Recording ★★★★★

Blues Traveler has survived the death of bassist Bobby Sheehan, replacing him with guitarist Chan Kinchla's brother Tad, adding a keyboardist, and moving forward. The band confronts demons and roadblocks within and without in "Rage" and "Pretty Angry." "All Hands" is a life-as-shipwreck anthem for the ages, and "You're Burning Me" is one of the most satisfyingly hard 'n' heavy songs these guys have ever sunk their teeth into.

Parke Puterbaugh

### EVE Scorpion

Ruff Ryders/Interscope

Music ★★ Recording ★★★★★

Eve is a gifted rapper, but *Scorpion* gets bogged down with too many guest stars (full employment for the entire Ruff Ryders posse seems to be a goal) and some tired posturing. Still, when she's on her considerable game, the results can be mesmerizing. She's got flow and smarts to spare, and cuts like "Who's That Girl?," "Let Me Blow Ya Mind," and "Life Is So Hard" are deft anthems to a certain kind of glossy feminism.

Claudia Perry

### DAWN UPSHAW

Angels Hide Their Faces

Nonesuch

Performance ★★ Recording ★★★★★

An intelligently conceived, beautifully sung,

### BROOKS & DUNN Steers & Stripes

Arista Nashville

Music ★★ Recording ★★★★★

The turbo-powered duo roars back with a mix of gritty country-rock and some ballads that won't make you queasy. Dunn shines all over this disc, from the Border-flavored "My Heart Is Lost to You" to the honky-tonk rouser "Lucky Me, Lonely You." And Brooks is fine in "Go West" and "Deny, Deny, Deny." It's good to hear these guys cranking it up and having some fun.

Claudia Perry

### THE GO-GO'S

God Bless the Go-Go's

Go-Go's/Beyond

Music ★★ Recording ★★★★★

JANE WIEDLIN Kissproof World

Painful Discs

Music ★★ Recording ★★★★★

Thoroughly modern Go-Go's! With the help of producers Paul Q. Kolderie and Sean Slade, all five original members come out boppin' and blatin' on an album that's way better than we had a right to expect. Guitars and spirits are up, up, up — and if you want to know where some of the kick comes from, check out Jane Wiedlin's current solo disc, a sassy slice of its own.

Ken Richardson



## POWDERFINGER

### Odyssey Number Five

Republic/Universal

Music ★★★ Recording ★★★★

They're poll-winning, magazine-cover-gracing heroes in their Aussie homeland, but they're virtually unknown in the States, and they mean to change that with their fifth album. They've got a knack for guitar hooks and moody love songs. This odyssey touches on dead-end jobs, brain-dulling suburbs, nervous wanderlust, and relationships run aground — twentysomething angst, in other words — and Powderfinger nails down that dolorous sensibility with precision.

*Parke Puterbaugh*

## ANI DIFRANCO

### Revelling/Reckoning

Righteous Babe

Music ★★★ Recording ★★★

DiFranco has many talents, but editing herself has never been one of them. This two-disc set includes everything from strident political songs to pointless in-jokes. She remains best when she turns inward. Whereas anyone can figure out that "white people are so scared of black people," it's subtler moments like those in "Imagine That" (about the performer/audience relationship) and "Fierce Flawless" (a poetic, jazz-tinged breakup song) that show how sharp DiFranco really is.

*Brett Milano*

## STEVIE NICKS

### Trouble in Shangri-La

Reprise

Music ★★★ Recording ★★★★

Her best work since *Bella Donna*? This is some of her best work since *Rumours*. Head straight for the songs sympathetically co-produced by Sheryl Crow. Enjoy, too, guest vocals by Sarah McLachlan, Macy Gray, and the Dixie Chicks'

Natalie Maines. But enough with the name-dropping: Stevie's own vocals sound nicely rehabilitated, and she wrote most of the material, so this comeback owes as much to her stick-to-itiveness as to anything else. *Ken Richardson*

## STEREOPHONICS

### Just Enough Education to Perform

V2

Music ★★★ Recording ★★★★

The Brit-poppers return with another refreshingly unpretentious, infectiously melodic, guitar-driven album. Pick hits: "Step on My Old Size Nines," which could be a latter-day alt-rock take on early Brinsley Schwarz, and "Mr. Writer," which sounds like a chance meeting between ELO, Stevie Wonder, early-1970s John Lennon, and late Rutles (!). Great stuff. *Steve Simels*

## THE PROCLAIMERS Persevere

Nettwerk America

Music ★★★ Recording ★★★★

Their first album in seven years finds Scotland's Craig and Charlie Reid older but no less spirited, still flashing their trademark sibling harmonies and still writing songs in the buoyant vein of their hit, "I'm Gonna Be (500 Miles)." Whether singing about their love of women, family, or country, the Reids remain disarmingly unselfconscious in conveying their heartfelt emotions. To hear them shout "Love rots the brain / No doubt about it" is to understand what true proclaiming is all about. *Billy Altman*

## CRAIG BAILEY Brooklyn

Evidence

Music ★★★ Recording ★★★★

Brooklyn is the name of the sextet led by alto saxophonist/flutist Bailey, whose sophomore effort is a rangy hard-bop set of mostly originals. Though Bailey has a knack for appealing melodies cleanly voiced, a distinct genre session like this rises and falls on the strength of its soloists.

TIP  
Sheet

## Coming Releases

### PERRY FARRELL

#### Song Yet to Be Sung

### DAVE NAVARRO Trust No One

Two former Jane addicts release solo CDs on the same day. Virgin (Farrell) and Capitol (Navarro), June

### A TWIST OF MARLEY

Lee Ritenour rounds up like-minded jazzers for a tribute to Bob. GRP, June

### NADJA SALERNO-SONNENBERG

#### Speaking in Strings

Documentary on the violinist comes to DVD-Video. Docurama, June

### BUILT TO SPILL

#### Ancient Melodies of the Future

"Idaho's favorite sons." Warner Bros., July

And it's his thick, chewy alto and Derrick Gardner's pebbly trumpet that lift this above the usual impressive competence. *Richard C. Walls*

### JILL SOBULE I Never Learned to Swim: 1990-2000

Beyond

Music ★★★ Recording ★★★★

If all you know of Sobule is her 1995 novelty hit, "I Kissed a Girl," you'll be doing yourself a favor by picking up this wonderful collection. Here's a lyricist whose wit and insights are as sharp as her pencil point, and a melodist whose choruses have more hooks than a schoolhouse coat rack. From the rollicking "Karen by Night" to the haunting "Houdini's Box," Sobule's songs reverberate with the ups, downs, and sideways of real life. How novel. *Billy Altman*

### STEVE WYNN

#### Here Come the Miracles

Blue Rose

Music ★★★ Recording ★★★★

Wynn has never made a less than interesting album, but this ambitious two-disc set — with all the expected Bob Dylan, Lou Reed, and Neil Young influences intact — is probably his most consistent effort, thanks to a sympathetic band and exceptionally sharp songwriting. Highlights include "Good and Bad," featuring a blistering 12-string solo, and "Watch Your Step," a brilliant garage-rocker. Is this Wynn's *Exile on Main St.* or *Zen Arcade*? Could be. *Steve Simels*

### JANET JACKSON All for You

Virgin

Music ★ Recording ★★★

Call this one *Out of Control*. I don't know what's worse: Janet's desperation to trump Britney and Christina both visually and orally, Jimmy Jim and Terry Lewis's *We're all out of ideas!* production, Janet's insistence that I want her sex in "Would You Mind," or Carly Simon's utterly embarrassing "rap" in "Son of a Gun." Yo, Janet: you're so vain, you probably think we still care about you. *Ken Richardson*







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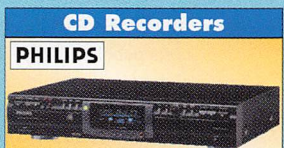
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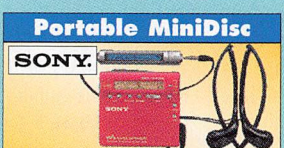
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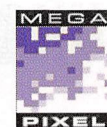
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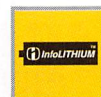
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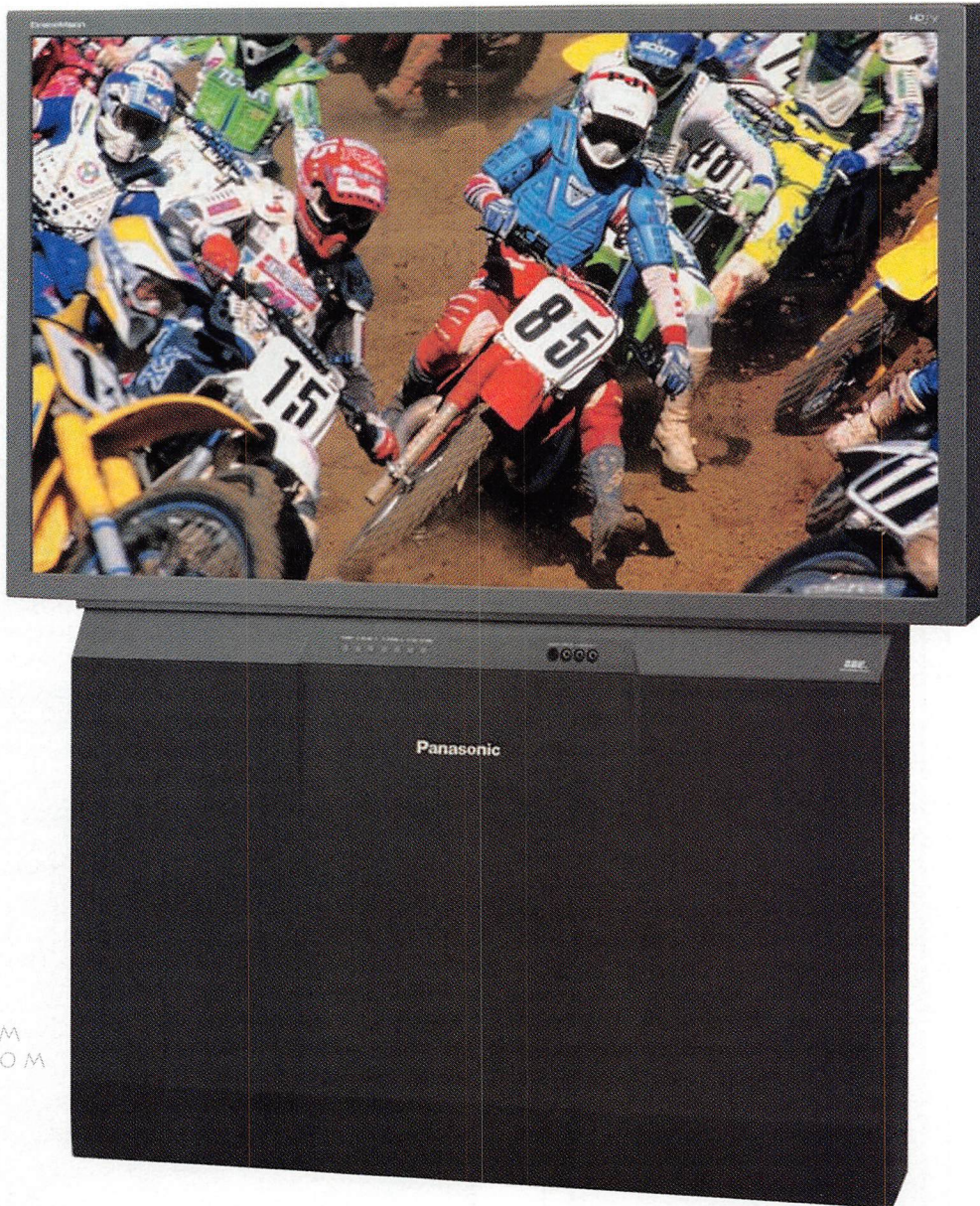
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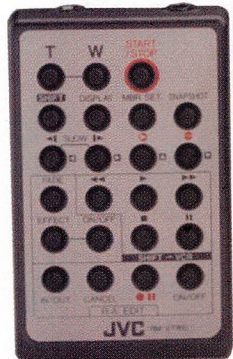
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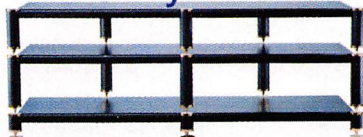


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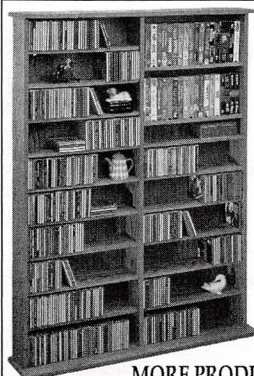


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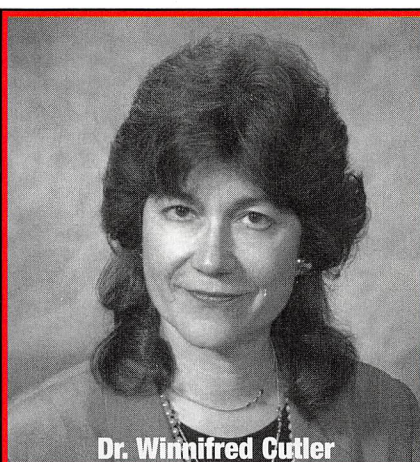
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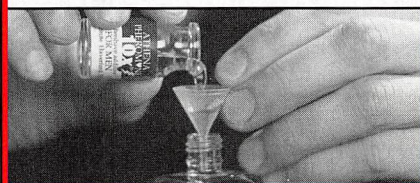
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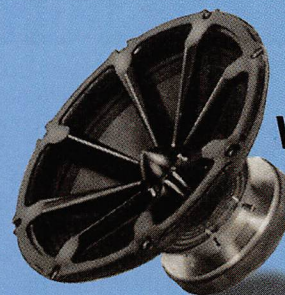
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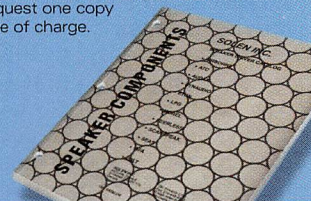
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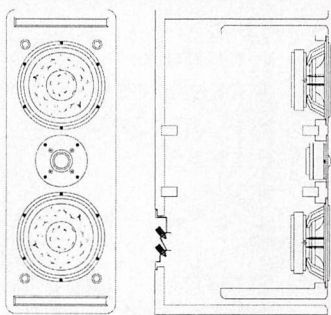


## LOUDSPEAKERS

# The Solist

Madisound is pleased to offer **Solist**, the latest addition to our high end speaker kits. We are confident that we have achieved a speaker that meets or exceeds the expectations of today's discerning Audiophile.

The **Solist** is very precise, capable of delivering the most demanding passage without losing the delicacy of every nuance. The **Solist** has an immediacy about it that elicits excitement in the listener, yet is never fatiguing. We have listened to the **Solist** on both transistorized amplifiers and tube amplifiers and found both to be pleasing.



Width 8 3/4" Height 24" Depth 13 1/2"

The **Solist** is designed around the popular **Scan-speak** 18W/8545K carbon/paper cone 7" woofer and the new D2905/9500 1" textile dome tweeter.

The **Scan-speak** woofer has a specially coated carbon impregnated paper cone and the patented SD-1 magnet system. The SD-1 magnet system minimizes modulation and dynamic distortion.

The **Scan-speak** tweeter features a textile dome, hand coated several times to produce a unique combination of dynamic linearity and damping of resonance.

The **crossover** network was designed using our anechoic chamber, Audio Precision and the Linearx Leap software. The 18dB bi-wire network yields a seamless response from 40Hz to 20KHz.

The **cabinets** are fully assembled oak veneered MDF with solid rounded oak corners in clear coat or black painted finish. The front and back are black and the front is covered by a full black grill. The kit can be assembled in an evening.

**Price per pair \$1140.00**



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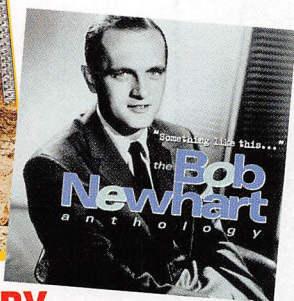
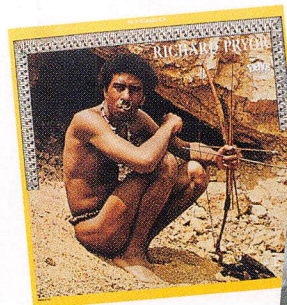
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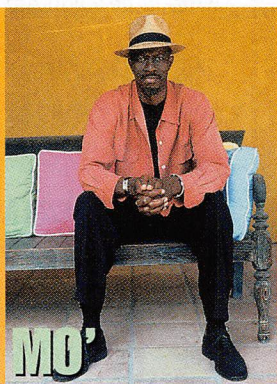
THINGS TO DO WHEN YOU'RE NOT READING **SOUND & VISION**



## EBONY & IVORY

A nine-CD boxed set from possibly the greatest standup comedian ever — and a two-CD set from Bob. Pryor's material is as strong now as when he first performed it, and every routine is still worth a listen. Newhart's hasn't aged as well, but there are still some gems here. Check out "The Grace L. Ferguson Airline (and Storm Door Co.)," the next time you're ready to fly on JetBlue. (Richard Pryor: ... *And It's Deep Too!*, Rhino, \$80; "Something Like This . . .," *The Bob Newhart Anthology*, Rhino, \$20)

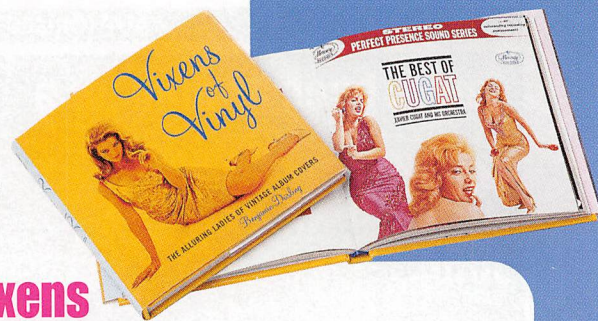
WITHERED ON THE VINE



## NO MO'

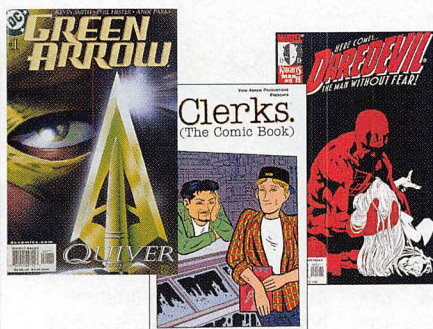
We've got a Redbone to pick with Keb' Mo' (real name: Kevin Moore). Idolized by critics as a real-deal, "I've been there and I'm here to tell you about it" Delta blues artist reborn, Mo' has recently branched out into opening for Celine Dion, releasing a children's album (*Big Wide Grin*), and writing music for a Victoria's Secret TV commercial and the theme for *Martha Stewart Living*. Does this mean we can now expect searing, soul-searching blues about a run in Heidi Klum's fishnet stockings, missing residuals checks, and Martha's stale buns?

**BUSHWHACKED** If *South Park* creators Trey Parker and Matt Stone can keep their straight-for-the-Chief-Executive-jugular sitcom as lean and mean as the early episodes — and if the show doesn't mysteriously disappear from the airwaves — they'll have finally given us a reason to watch TV. (*That's My Bush!*, Wednesdays, 10:30 p.m., Comedy Central)



## Super Vixens

Today, if you want to sell a CD, you put a babe on the cover. Forty years ago, if you wanted to sell an LP, you put a vixen on the cover. Invite the bygone gals back into your home with *Vixens of Vinyl* (Chronicle, \$15), a delightful mini-coffeetable book with witty commentary by Benjamin Darling, who bemoans the shock values of the new century: "Doesn't anybody appreciate innocent titillation anymore?" — Ken Richardson



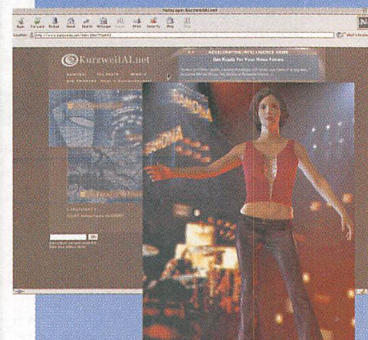
## COMIC RELIEF

You've seen the movie, but have you read the comics? Writer/director Kevin Smith has written a handful of hilarious comics based on the Jersey slackers from his film *Clerks*. Smith has also raised hell for Marvel Comics by resurrecting *Daredevil*, turning a title that had fallen from grace into a Top 10 seller. He also hits the bull's-eye every month with DC Comics' recently relaunched *Green Arrow*. Slated for June is *Chasing Dogma* (Image Comics), a paperback that bridges the gap between Smith's *Chasing Amy* and *Dogma* feature films (sorry kids — like the movies, this one's R-rated). Smith's next flick, *Jay and Silent Bob Strike Back*, is due out in August. — Drew Thompson

## WEB HITS

### YOUR FUTURE REVEALED

When machines take over the earth, you can blame Raymond Kurzweil, founder of KurzweilAI.net. His site compiles cutting-edge discussion about artificial intelligence in a slickly designed virtual hub. Visitors are guided by the comely Ramona (below), who answers questions, steers your browser, and sings — all without a single "Syntax Error." — Peter Pachal



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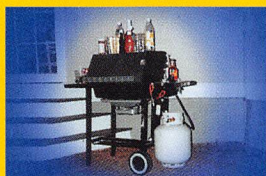




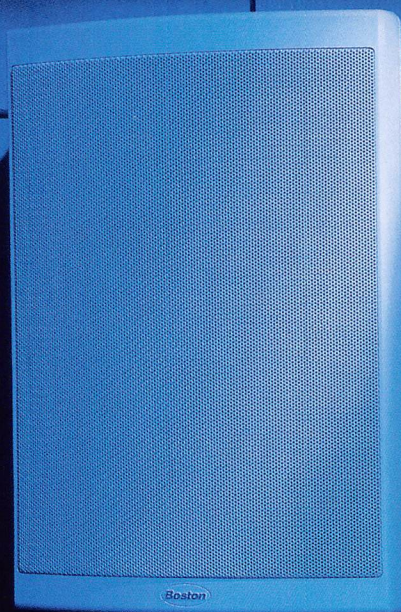


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